NOV 3 1920

The

British Medical Journal

The Journal of the British Medical Association.

INCLUDING AN EPITOME OF CURRENT MEDICAL LITERATURE.

WITH SUPPLEMENT.

No. 3120. SATURDAY, OCTOBER 16, 1920. **Price 1/-**

STERILITY IN WOMEN.

By ARTHUR E. GILES, M.D., B.Sc., Ch.B., F.R.C.S., M.R.C.P., Senior Surgeon to the Chelsea Hospital for Women, Gynæcologist to the Prince of Wales's General Hospital, Tottenham.

Demy 8vo. Cloth. 213 pages. Illustrated. Price 10 - net.

"For the General Practitioner this is an ideal book, full of information."—*Medical World.*

"The best that has been written on the subject."—*British Medical Journal.*

HENRY FROWDE, HODDER & STOUGHTON, 17, Warwick Square, Newgate Street, London, E.C.

By the same Author.

DISEASES OF WOMEN.

With Sir JOHN BLAND-SUTTON. 7th Edition. WILLIAM HEINEMANN.

GYNÆSOLOGICAL DIAGNOSIS.

AFTER RESULTS OF ABDOMINAL OPERATIONS.

BAILLIÈRE, TINDALL & COX.

OXFORD MEDICAL PUBLICATIONS

JUST PUBLISHED.

CLINICAL OPHTHALMOLOGY FOR THE GENERAL PRACTITIONER.

By A. MAITLAND RAMSAY, M.D., Fellow of Royal Faculty of Physicians and Surgeons, Glasgow; Lecturer on Ophthalmology, University of Glasgow; Ophthalmic Surgeon, Glasgow Royal Infirmary.

With an Introduction by SIR JAMES MACKENZIE.

Royal 8vo. Cloth. 500 pp. with 20 Plates, 11 of which are in Colour. Price £2 2s. 0d. net.

A TEXT-BOOK OF PHARMACOLOGY AND MEDICAL TREATMENT FOR NURSES

BY J. M. FORTESCUE BRICKDALE, M.A., M.D., M.R.C.P., Physician, Bristol Royal Infirmary; Clinical Lecturer, University of Bristol.

Royal 8vo. Cloth. 408 pp., fully Illustrated and with 5 Colour Plates. Price 25s. net.

HENRY FROWDE AND HODDER & STOUGHTON, 17, Warwick Sq., Newgate Street, London, E.C. 4.

THIRD EDITION. Pp. viii + 92, with 4 Plates. Price 4s. 6d. net. (postage 4d.).

THE INTENSIVE TREATMENT OF SYPHILIS

and Locomotor Ataxia by Aachen Methods.

By REGINALD HAYES, M.R.C.S.

The Lancet says: "No better exposition of the method as practised there can be found than that contained in this little book."

BAILLIÈRE, TINDALL & COX, 8, Henrietta Street, London, W.C. 2.

JUST ISSUED.

THE DUODENAL TUBE AND ITS POSSIBILITIES

BY

MAX EINHORN, M.D., New York.

See SAUNDERS' Advertisement on Page 3.

THIRD EDITION, Enlarged. Price 16s.

CLINICAL METHODS IN TROPICAL MEDICINE.

By G. T. BIRDWOOD, M.A., M.D.Cantab., D.P.H., *Late Principal, Agra Medical School.* AND FIVE OTHER CONTRIBUTORS.

A Guide for Practitioners in the Tropics in Diagnosis and Therapeutic Measures.

Published by THACKER & Co., Creed Lane, E.C.

JUST PUBLISHED. Crown 4to. Pp. 220. With 180 Illustrations in Colour. Half-tone and line. Price 12s. 6d. net.

WAR AGAINST TROPICAL DISEASE

By ANDREW BALFOUR, C.B., C.M.G., M.D., B.Sc. (Public Health), F.R.C.P.Edin., D.P.H.Camb., *Director-in-Chief, Wellcome Bureau of Scientific Research.*

This is a practical treatise and of special interest to medical officers serving in tropical countries, sanitary inspectors, tropical administrators, employers of labour in the tropics, and all concerned with the questions of Sanitation and Health in hot climates.

BAILLIÈRE, TINDALL & COX, 8, Henrietta Street, Covent Garden, W.C. 2.

ESSAYS ON THE SURGERY OF THE TEMPORAL BONE.

By Sir CHARLES BALLANCE, K.C.M.G., C.B., M.V.O., M.S., F.R.C.S., Consulting Surgeon to St. Thomas's Hospital, &c. Illustrated by 125 Plates (40 in colour), and 120 Figures.

In 2 volumes. Medium 4to. Price 5 guineas.

MACMILLAN & Co., LTD., St. Martin's Street, London, W.C.

J. & A. CHURCHILL'S NEW BOOKS.

GASK & WILSON'S SURGERY. 39 Plates, 467 Text Figures. £2 2s. net, postage 1s. 3d.

JAMESON & MARCHANT'S SYNOPSIS OF HYGIENE. 18 Illust. 18s. net, postage 9d.

JOBLING'S CATALYSIS. 2nd Edition. 12 Illustrations. 7s. 6d. net, postage 4d.

CUFFS LECTURES ON MEDICINE TO NURSES. 7th Edition. 29 Illus. 7s. 6d. net, postage 4d.

ROBERTS' SYNOPSIS OF PHYSIOLOGY. 73 Illustrations. 15s. net, postage 4d.

JEX-BLAKE'S PHYSICAL SIGNS IN THE CHEST & ABDOMEN. 27 Illus. 9s. 6d. net, postage 4d.

JELLETT'S SHORT PRACTICE OF MIDWIFERY. 8th Edition. 276 Illus. 18s. net, postage 8d.

FRAZER'S ANATOMY OF THE HUMAN SKELETON. 2nd Edition. 219 Illustrations. 36s. net, postage, 1s.

London: 7, Great Marlborough St., W. 1.

Second Edition, Enlarged. Crown 8vo, 7s. 6d. net. With 31 Original Photographs and 150 Special Prescriptions.

TREATMENT OF

DISEASES OF THE SKIN.

By KNOWSLEY SIBLEY, M.D.Camb., London: EDWARD ARNOLD, 41 & 43, Maddox St. W.

SKIN DISEASES IN GENERAL PRACTICE.

By HALDIN DAVIS, M.B.Oxon., F.R.C.S., Dermatologist to the Royal Free Hospital. Price 17/- net. Illustrated by 7 Coloured Plates and 62 Photos.

". . . The notes on treatment are particularly good."—*British Medical Journal.*

". . . can be confidently recommended to students and physicians."—*London Hospital Gazette*

Published by HENRY FROWDE & HODDER & STOUGHTON, 17, Warwick Sq., Newgate Street, London, E.C. 4.

By Sir ARBUTHNOT LANE, Bart., M.S.

OPERATIVE TREATMENT OF FRACTURES.

SECOND EDITION, with 266 Illustrations, 10/-.

ADLARD & SON & WEST NEWMAN, Ltd., 23, Bartholomew Close, E.C. 1.

CLEFT PALATE AND HARE-LIP

With additional Chapters by CORTLANDT MACMAHON and Mr. WARWICK JAMES.

THIRD EDITION, with 58 Illustrations, 12/-.

ADLARD & SON & WEST NEWMAN, Ltd., 23, Bartholomew Close, E.C. 1.

REGISTERED AS A NEWSPAPER.]

[COPYRIGHT]

[ISSUED WEEKL

HEWLETT'S SPECIALS

MIST. PEPSINÆ CO. c. BISMUTHO

(HEWLETT'S)

Useful in all forms of Dyspepsia, Pyrosis, Gastric Pain, and Vomiting, and for alleviating the pain in cases of Ulcer and Cancer of the Stomach.

DOSE.—ʒss to ʒj diluted.

"Messrs. Hewlett's preparation of Pepsin and Bismuth is of standard excellence. The combination is a particularly good one for the treatment of diseases of the stomach which require a sedative."
Medical Review, August, 1905.

Liq. Santal Flav. c. Buchu et Cubebâ

(HEWLETT'S)

Since its introduction it has been largely prescribed all over the world as a specific in certain cases.

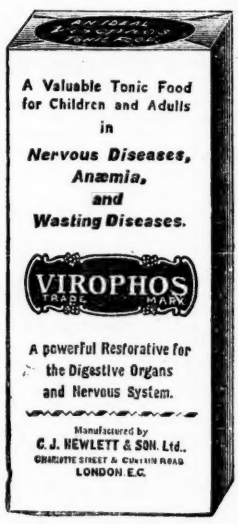
DOSE.—ʒj to ʒij in water or milk.

"Experience has shown this preparation to possess the same efficacy as Santal Oil itself."—*Practitioner.*

VIROPHOS.

An Ideal Tonic Food. Easily Digested.

FOR CHILDREN AND ADULTS.


A Valuable Tonic Food for Children and Adults in
Nervous Diseases, Anæmia, and Wasting Diseases.
VIROPHOS
TRADE MARK
A powerful Restorative for the Digestive Organs and Nervous System.
Manufactured by
C. J. HEWLETT & SON, Ltd.,
CHARLOTTE STREET & CURTAIN ROAD
LONDON, E.C.

"VIROPHOS.—This consists of Casein, Extract of Malt, and Sodium Glycerophosphate. It is pleasantly flavoured, and makes an excellent tonic food in all conditions of debility and wasting diseases. It is distinctly more palatable than many preparations of a like nature."
The Medical Annual, 1917.

Samples and Literature sent to Medical Men on request.

Obtainable from all Chemists, in tins, in four sizes.

C. J. HEWLETT & SON LTD

35 TO 42, CHARLOTTE ST.

Telegraphic Address, "PEPSINE NORTON, LONDON" **LONDON, E.C.** *Telephones:* 1172 LONDON WALL, 5271 CENTRAL

The First Murphy Memorial Oration.

DELIVERED BEFORE THE AMERICAN COLLEGE OF SURGEONS, IN MONTREAL, OCTOBER 11TH, 1920.

BY

SIR BERKELEY MOYNIHAN, K.C.M.G., C.B., F.R.C.S.,

PROFESSOR OF CLINICAL SURGERY, UNIVERSITY OF LEEDS.

"The moral of the whole story is this: that we should do all that we can to partake of virtue and wisdom in this life." (Socrates is speaking.)

THIS is a day of remembrance. We have come together to do honour to one of the founders of this College, a great surgeon whose loss we mourn. You have laid upon me the duty and the high privilege of offering in your name and in my own, and if I may for the moment assume a wider responsibility, in the name of all the surgeons of his time, a tribute to the illustrious memory of Dr. J. B. Murphy.

John Benjamin Murphy was an arresting personality. Even after the briefest intercourse with him there were few people who did not realize that he possessed a curious and subtle power of impressing a sense of his character upon them. His very handsome face, his tall, spare, almost gaunt figure, his high-pitched and vibrant voice, his burning and quenchless enthusiasm for life in all its manifold activities, his power of complete self-expression, all clamoured for notice, and caught and held the most eager attention. His outlook was grave and serious; he seemed always in earnest. The little quips and sallies, the friendly taunts, the provocations to repartee, the illuminating anecdote, which in the United States distinguish the cordial intimacies of daily life, did not seem to play around him as freely as around other men. Even in a crowded room of busy men, or when a debate was keen, he would steal a few moments for a whispered conversation, held aloof, on some topic that for the moment filled his thoughts. Among those who knew him well he was admired and deeply respected, rather than loved. Except to a very few he was not genial or responsive in friendship. His intellectual attainments were so considerable, and his position in the judgement of his contemporaries so secure, that jealousy hardly touched him, except perhaps in his earlier years and from a few among his seniors whose supremacy he challenged. Such jealousy is, perhaps, the tribute paid to youth for successful enterprise in thought or in action, by minds which suffer from the atheroma of advancing years. We are reminded of the aphorism of Sir Walter Raleigh:

> For whoso reaps renown above the rest
> With heaps of hate shall surely be opprest.

Murphy was beyond question the greatest clinical teacher of his day. No one who listened to him can ever forget the experience. Before his audience arrived he had everything very carefully prepared—diagrams in order, microscopes ready, the patients examined, and all relevant literature at his finger-ends. There he stood in the middle of the circle, in the theatre, with his assistants and friends in the first row and the other benches packed to the roof with eager students, or with medical men, who came again and again to learn from him afresh. As he began to speak one felt a strange sense of disappointment, and even of dismay. For while the handsome face and upright figure were things of real beauty, the voice in which he began to speak was quite unpleasant. It was harsh, even raucous, high-pitched, shrill, apt to wander into other keys. It seemed strange that a man of Irish descent, and of so gracious and commanding a presence, should have a voice so lacking in softness, one which not only did not appeal, but actually displeased and almost repelled every listener. But as he continued speaking the voice gradually ceased to distract, it became smoother, quieter, and more evenly pitched, and all thought of it was now lost in rapt attention to the matter. For things were happening even while one's first emotions were roused. Questions were being asked and answered, often with great rapidity; then would come a pause, in which with marvellous directness and power the lesson to be learnt therefrom was driven home. The rally began again. A poor answer came, or an assistant responsible for the clinical notes had omitted to inquire upon some relevant point; raillery came in torrents, never ill-natured, never rancorous, but with just sufficient sting to leave a memory which would stimulate all future work.

The discussion warmed imperceptibly; gradually the chain of argument lengthened as link after link, forged under our eyes, newly appeared; slowly there came a sense of excitement, of impending revelation; all inquiry, all disclosure, all argument, was leading up to something that we now ached to learn. Old observations and ancient truths were taking on a new complexion; relations hitherto unsuspected were here declared and explained. The whole intellectual mechanism underlying a great subject was being shown both in detail and in all the majesty of many moving parts. Perhaps, as we drew near to the end, when the whole story would be laid bare, a question barked at one of his audience would fail to be answered. With voice more clamorous, and menacing almost, with face strained and eager, with figure reaching forward and arm outstretched, he would hurl the question at others. Hearts beat faster; the spiritual anguish could hardly be borne. At last the answer would come, and after a final swift induction or brief summary; when the clinical journey was over we sank back in happiness and mental repletion to wonder if Stevenson could really have been right when he said, "It is a better thing to travel hopefully than to arrive," for this journey had been happy, though anxious enough, but the haven was a rest of tranquillity and wonder and contentment.

And then Murphy would operate. Now, of operators there are many types, and, like every other work of art, an operation is the expression of a man's temperament and character. There are still among us "brilliant" operators, from whom I pray to be spared when my hour has come. For them it is the mere quality of effort that counts. Their ideal of operative surgery is something swift and infinitely dexterous, something to dazzle the beholder and excite his wonder that such things can so be done by human hands. The body of a man is the plastic material in which an artist works, and no art is worthy of such a medium unless it has in it something of a sacrament. Surgery of the "brilliant" kind is a desecration. Such art finds its proper scope in tricks with cards, in juggling with billiard balls, and nimble encounters with bowls of vanishing goldfish. But Murphy was of the true faith. He believed in safe and thorough work rather than in specious and hazardous brilliance. He was infinitely careful in preparation, and compared with many was inclined to be slow; but every step in every operation which I ever saw him do was completed deliberately, accurately, once for all. It led inevitably to the next step, without pause, without haste; that step completed, another followed. "In sequent toil all forwards did contend." And so when the end came a review of the operation showed no false move, no part left incomplete, no chance of disaster; all was honest, safe, simple; it was modest rather than brilliant. During the whole operation Murphy talked; not wasting time, but expressing and explaining aloud the quiet, gentle, dexterous movements of his hands and the purposeful working of his mind. The operation over, he would draw his stool near to the front row of the benches, cross one leg over another, rest his elbow on his knee, and talk, as only he in all the world could talk, of surgery in general, of this case in particular, of his faults, of any experiment made to clear a doubtful issue. In these quiet talks there was none of the earlier passion which had gleamed through him, and which, caught up by his audience, had made them throb and tremble with suspense or joy. In them all his former experience, all that he had learnt by contact with men and books, all his native ingenuity of mind, were now bountifully displayed; the vast resources of the keenest surgical intellect of his day were now displayed, not with ostentation or with florid pride, but in such a quiet manner as to show that he rejoiced in the privilege of sharing with others so many fascinating and wonderful things. If, in answer to a request, a little intellectual gift were made to him, it was welcomed with frank, almost boyish, enthusiasm, and with a delight and a humility obviously genuine.

Murphy as a writer and as a speaker was prolific. Whenever he spoke men made haste to hear him. His audience, or so it always seemed to me, were often held back from quick appreciation. He was not like other men instantly attractive as an orator. Yet, as he developed his argument little by little and step by step, the audience warmed to him; he interested them, he

intrigued them, he dominated them, he fired them; intellectually he roused them to breathless interest; emotionally they were at times at the limit of self-control. No one could bear to miss a word, and while Murphy spoke no man left his seat. For his meaning was conveyed in pellucid language, and though he might speak with the vehemence of raging conviction, his thought was never obscured in a smoke of words. Such an intellectual loadstone was he that appointments were missed and hunger and thirst and fatigue were forgotten. For while Murphy expounded his gospel everything else seemed to fade in importance, overshadowed by the lessons which were now being learned so eagerly.

I often wondered, as I listened, in what degree he resembled Lincoln. The tall, gaunt frame, and the harsh and meagre and strident voice were the same. Murphy must have been one of the handsomest men of the day; Lincoln's features were haggard, plain and homely, but his deep and glowing, sad and tender eyes no man could forget. Murphy had no such command of language as Lincoln, certainly one of the greatest orators who has ever spoken our language. But in effect they must have been alike. For they made everything else seem commonplace when they spoke, and they seemed to be delivering a message charged with truth and pregnant with confidence and hope. Lord Charnwood, in his most excellent work on *Abraham Lincoln*, writes of him: "His voice, when he first opened his mouth, surprised and jarred upon the hearers with a harsh note of curiously high pitch. But it was the sort of oddity that arrests attention, and people's attention once caught was apt to be held by the man's transparent earnestness." How exactly was this the case with Murphy also! No one who heard Murphy speak ever doubted his sincerity. One might not agree; one might, indeed, profoundly and confidently disagree with some statement he made, perhaps as though to provoke a challenge, for there was much in Murphy which justified his patronymic, and which discovered his ancestry; but there was never a thought that Murphy himself was speaking other than his deep and tried convictions. He never looked on truth askance and strangely. One who heard Lincoln speak at Peoria wrote: "Beyond and above all skill was the overwhelming conviction imposed upon the audience that the speaker himself was charged with an irresistible and inspiring duty to his fellow men." Such an impression was often felt by audiences while Murphy was addressing them.

One thing Murphy lacked; in one respect he grievously failed. If we consider the qualities which go to the making of the greatest surgeons, a foremost place must always be conceded to the capacity to train great disciples. The teaching, the diligence, the general outlook upon surgery, and a finished technical skill can all be drilled into the minds and imposed upon the methods of an earnest student. But it is the inspiration, the lofty sense of a sacred mission worthy of all the best that is in you, the dedication with humblest and fullest devotion to the cause of scientific truth, and of loyal service to mankind, that are awakened with a thrill in great men by great teachers. It was here that Murphy fell short. He trained no one worthy to be his successor; no evangelist who could carry into other clinics or to other countries some of his glow, his fervour, his complete devotion, or the full meaning of his gospel. For this great omission there were perhaps some compensations. There were few clinics in any part of the world in which something taught by Murphy or inspired by him had not crept in and found a home. His name was often on the lips of surgeons in all lands. His views impressed themselves on men's minds. His methods were closely copied. But when Murphy laid his mantle down there was no one ready and worthy to take it up. When we remember how the pupils of Turner of Edinburgh became professors in most of the Chairs of Anatomy throughout the British Empire, how many men Billroth trained to occupy with great distinction the Chairs of Surgery in Eastern Europe, how Welch is the happy parent of a great school of pathologists trained by him, inspired by him, and looking to him with reverent affection, we cannot refrain from regret that some of the acolytes of Murphy did not grow to the stature of high priests.

Year by year Murphy grew in intellectual power and in the dominion he exercised over the minds of men. A problem took on a different aspect if Murphy were engaged in it. He touched the common currency of surgical thought and changed it into gold. For no effort of his was meaningless or sterile, and all the powers of his mind and of his frail body were spent ungrudgingly in all his work. His well-stocked library, and all new literature were searched for him, and dispatches made for his assimilation. He worked as all great men should work, with a clean desk. His great powers were used for worthy purposes and in due season, nothing was wasted in mere hack work, for all that could be equally well done by others was left for them to do. Yet all his life he overworked. He had an inner restless spirit, which drove him at full speed. He must work, and while at work there was only one speed, the highest he could command. "I do not wish to linger after my work is done," he said, and it was exactly what might have been expected from him.

It is useless to wish that men possessed of his qualities and capacities should use themselves differently. A man must do as he must do. If we think that Murphy by spending himself with less lavish extravagance might have prolonged his life another ten years and so have achieved even greater results, to the benefit of all mankind, we are pondering over one who was not Murphy, and who could not in those early fruitful years have been so avaricious for work, or so generously have poured forth the new truths of which he was at once both parent and missionary. Our designs for another man's life are but futile exercises of an imagination lacking in full understanding.

Such, then, was Murphy as I knew him. It is easy now to see how great a figure he was in the world of surgery of his day. When all his work is reviewed, when not only its range but the wonderful sincerity and the permanent and piercing accuracy of so large a part of it are considered; when we remember his unequalled gifts as teacher, his power of lucid exposition and of persuasive or coercive argument, his devotion for many years at least to experimental research, it is no exaggeration, I think, to say of him that he was the greatest surgeon of his time. Great men are fitted to their times, and in many respects are a reflex of them. But as their times pass their work is seen in far perspective, and may appear to shrink in significance. It may then seem to have lost all its originality and boldness and force, and we who stand afar off, untouched by the magnetism of a great personality, marvel at its influence in its own day. For there are few indeed who enjoy both celebrity and fame, both glory and immortality. "Mere talents are dry leaves, tossed up and down by gusts of passion and scattered and swept away; but genius lies on the bosom of memory." How, then, will it be with Murphy? Judged by the standard of his contemporaries he was an intellectual giant, but of what stature will he be when judged by the standard of history? May I ask you to bear with me while I pass briefly in review some of the main features of the progress of surgery as science and art and tell the tale of some of the great men who have laboured in it from earliest days up to the present time, so that at last we may see how Murphy stands and what figure he will make in the Great Procession?

Epochs in Surgery.

The earliest remains of man known to exist show that the art of the surgeon was practised upon him. Wherever skulls of the Neolithic period have been discovered the openings made in them by the trepan are seen. Dr. Marcel Baudouin, in 1908, found within a tomb discovered by accident at Belleville the remains of 120 human beings. Eight of the skulls had been trepanned, and the edges of the cut bones are smoothly healed over, showing beyond doubt that the patients survived the operation for periods long enough for this to be fully accomplished. The disc of bone removed is supposed to have been worn as an amulet. The operation of trepanning during the Neolithic period was also performed in England, in Northern Africa, the Canary Islands, Mexico, and in Peru. It is performed to-day by the natives of New Ireland, to the east of New Guinea, by methods and with results apparently similar to those of the Neolithic age. Dr. Redman has presented to the Royal College of Surgeons of England a group of five skulls showing the effects of the operation, the instruments by which it is there performed, and the

dressings applied to the wound. And travellers tell us that the operation is still practised in the ancient way, so far as can be judged, by the Quichuas of Peru. Surgery is therefore as old an art as any.

Hippocrates.

Hippocrates was the first to give form and spirit to the practice of surgery. His observations, even when considered with the fuller knowledge of to-day, often bewilder us by their accuracy, insight, and sagacity. His clinical methods, judged by our modern standards, were broad-based and structurally sound. He recognized not only the nobility of the art of surgery and the worthiness of its practitioners, but was well aware of the powerful influence which the craft must exert upon the science of medicine. The divorce of hand from brain which modern custom has worked hard to effect derived neither sanction nor authority from any words of his. As he deals with the outward showing diseases his clinical method is everywhere the same. He observes, reflects, weighs, and judges, considers his former experience of the like or analogous conditions; he suggests or discovers a general truth, he lays down principles for action, and he tells how the craftsman shall work. If the power of wide and accurate generalization be, as I believe it to be, among the supremest accomplishments of the human mind, then Hippocrates may in truth be said to have had few rivals—if, indeed, he has had any—among all those who in later times and in all countries have devoted themselves to the science of medicine. For by his injunctions as to the method of inquiry into the conditions of a patient suffering from any disease he lays down for the first time the principles upon which inductive research is founded. He is the parent, not of medicine alone, but of the inductive method as applicable to all branches of natural science. It is a proud claim that the method found its first application in the science of medicine.

His observations upon cerebral injuries were hardly bettered until our own day, and many of his instructions as to their treatment cannot be neglected even now. He notes the effect of brain injuries upon the limbs of the opposite side. His work on fractures and dislocations has received praise from the greatest of critics. Littré spoke of it as "the grandest surgical monument of antiquity," and considered that the truth of its principles was eternal. A century ago the most eminent of French surgeons, Dupuytren, published a work on "Dislocations." Malgaigne, whose familiar name justly carries great weight, judged that, in respect of its discussion of congenital dislocations, the work of Hippocrates was the richer and more accurate. The discourse of Hippocrates on wounds, which I read once again in the early weeks of the war, seems to have, in more relations than one, a bearing upon our bitter experience of those most grievous times. Certain it is that for 1,500 years afterwards nothing so apt was written; by no one were the essential problems of wound treatment so well understood. The dressings applied to wounds, he tells us, were to be of new materials; water, if not clean and sweet, was to be boiled and strained before use; care of the surgeon's hands and nails was thought most necessary. Oil and wine were the balsam for a bruised or dirty wound, or for one long neglected. The accurate apposition of the wound surfaces and the exclusion of air were means to secure rapid healing by primary intention, which was clearly distinguished from second intention. He dreaded amputation of the limb, especially near the trunk; these operations to-day are in respect of their mortality still among the most lethal of all. As Sir John Tweedy has said, "The directions which Hippocrates gives concerning the arrangements of the operating room, the placing of the patient, the position of the assistants, the disposition of the lighting, the care to be taken of the surgeon's hands, the need of ambidexterity, all indicate a careful and experienced practitioner." Hippocrates may count among his greatest glories that he recognized the essential unity of medicine and surgery, or rather that he did not distinguish between them; that he urged and practised the use of all means for the examination of the patient; that he saw no degradation, as did so many later ages, in the use of a physician's hands in the service of the individual patient, for whose welfare, as Aristotle said, all medicine exists. And his system, which embodied observation, reflection, judgement, all multiplied to make experience which shall decide right action, stands firm until this day. He knew its difficulties, for he tells us that "experience is difficult, verification fallible, observation long and costly, and occasion fleeting." There is one gap, however—a significant one in view of my later contention—in his method: he did not put matters to the proof by way of experiment. The experimental verification or denial of a suggested truth, or the new adventures in thought and action opened up by this method, were not for him.

Celsus.

After Hippocrates we may take a long stride in point of time to the days of Celsus, who lived in the reign of Augustus Caesar. It is interesting to remember that Celsus, the manuscript of whose work *De Re Medicina*, written about 30 A.D., was discovered in 1443 in the Church of St. Ambrose at Milan by Thomas of Sexanne, afterwards Pope Nicolas V, was almost certainly not a physician. He was a noble of the family of Cornelii, who wrote works on medicine, agriculture, philosophy, law, and the art of war, in the spirit of an interested amateur. The deep prejudice of the patricians against the adoption by one of their class of medicine as a profession was unconquerable; and the internal evidence in all his writings is opposed to the view that he could have practised as a physician. He mocks at the value of medicine, and esteems the empirical methods of folk medicine as of equal interest and value to the academic methods of his time. He tells us that the true art of medicine lies in the correlation of theory and practice, the one guiding and controlling the other; speculation should guide thought but not determine practice. References to surgical matters are found in all the books, but Books VII and VIII are devoted exclusively to the consideration of surgical matters. The great feature of these is that they record all the changes which had occurred in our art from the time of Hippocrates, and especially informs us of the greatest attainments of the Alexandrian school in anatomy and surgery. He describes wound treatment in detail: arrest of haemorrhage in a wound may be effected by packing and pressure, or by the ligature, which finds its first mention in his work. Sutures are to be used to secure apposition of wound surfaces and edges, and, as a dressing, linen bandages are to be soaked in wine, water, or vinegar. He gives in sufficient detail a description of operations for the radical cure of inguinal and umbilical hernia, and for the first time he refers to the removal of the testis as allowing a firmer and more secure closure of the inguinal canal. He mentions translucency as a test for hydrocele, and describes the tapping of dropsies. He quotes a large number of surgical authors, but among them all only Hippocrates is known to us.

It is evident that by the time of Celsus the boundaries of surgery had been sensibly enlarged, that old procedures had been bettered, as in amputations, and that many new ones had been devised. But progress had been along the old lines and was achieved by the old methods. He recorded the multiplication and the magnification of old experiences rather than the revelation of new discoveries. He it was who gave us the fulfilment of the promise of the Hippocratic methods.

Galen.

But great as were these methods, and considerable as was the success attending their application, there had been a slumber of the intellectual and philosophical aspects of medicine. Hippocrates had united in his own person many divergent and opposing tendencies; after his death there was an acceptance of his teaching by various sects, each adopting a part only, and dogmatism with its cramping tendencies crept in and the spirit of investigation died away. There was need now of a philosopher with new vision, and the need was supplied in Galen. Of Galen's life and character we know much, for he was vain and ambitious, garrulous and verbose. He was trained and deeply versed in all the current philosophies. A dream of his father, Nikon, interpreted as a vision from the God of Medicine, decided his choice of a profession. After the death of his father he wandered for nine years, studying in Corinth, Smyrna, and especially Alexandria, which then attracted commerce and patients from all parts of the world. His opportunities were great and his use of them unwearying. He wrote works on anatomical and

physiological matters, and attained even in his early years a reputation for wisdom and sagacity. For four years he lived in Rome. His learning, his industry, his friendship with the great and the noble, brought him high repute. But the envy of his colleagues, which he did much to provoke, was his downfall, and he fled in fear of his life, to return on the invitation of Marcus Aurelius some twelve years later.

But Galen's chief claim to honour, an imperishable one, is that he was the first of physicians to bring experiment to the aid of medicine. As Hippocrates was the parent of inductive method, so was Galen of the deductive. He was the first experimental physiologist. It was he who first discovered and described the cranial nerves, and the sympathetic nervous system; he divided the spinal cord and produced paraplegia; he severed the recurrent laryngeal nerve, and produced the hoarseness and aphonia which are the constant results of this injury. He discovered the function of a muscle by studying the loss of power which followed its division. He demonstrated the flow of urine from the kidney to the bladder along the ureters by a series of experiments than which nothing to-day could be more conclusive. And he trembled at the very edge of a great discovery when he wrote, "If you would kill an animal by cutting through a number of its large arteries you will find the veins becoming empty along with the arteries; now this could never occur if there were not anastomoses between them." Unhappily, experiment alone did not content him, nor experiment in close alliance with clinical observation. His knowledge of anatomy, unsurpassed by any of his time, did not keep him aloof from the wildest speculations in natural philosophy. It is interesting to learn from him that the art of dissection was mainly, if not wholly, confined to certain families, among whom tradition and instruction gave rise to a *caste* of dissectors. The members of a family were, from their childhood, exercised by their parents in dissecting, just as familiarly as in writing and reading, so that "there was no more fear of their forgetting their anatomy than of forgetting their alphabet."

Galen's dissections were confined to the bodies of animals, and the facts so discovered were applied by analogy only to the bodies of men. If a physiological hypothesis charmed him, his anatomical observations had to give way to it. His mind ran riot in speculation, often fantastic and far-fetched, but occasionally showing a gleam of real insight, as, for example, in his belief that there was a close primary correspondence between the sexual organs of the male and female. But the evils were great and lasting. It was his rash conceits rather than the facts of his experiments, or his sound anatomical knowledge and broad scientific purpose, which were remembered, and indeed almost sanctified, by all men for a period of almost 1,500 years. Though he was the first of experimenters, he asserted that speculation should lead to experience, and he exalted a debased metaphysics to a height exceeding that of strict and sober observation. In the times of intellectual stagnation in the dark ages, the writings of Galen had an unequalled authority, and it was only by a notable independence that Abdollatif dared to assert that anatomy was not to be learnt from books, and that even Galen's observations were less to be trusted than the evidences of one's own senses. The result was the sterility and the abasement of medicine, until the experimental methods were revived by his direct intellectual descendant William Harvey.

Avicenna.

In a rather different sense, and in a different scene, the great traditions of medicine were handed on by Avicenna, who was born in Bokhara about 980 A.D. It was through him that the works of Hippocrates and Galen became widely known throughout the East, and finally filtered back into Europe through the Arabs and Moors at a time when learning and culture had almost vanished. The Arabian mind was essentially concerned with compiling knowledge from all sources rather than in initiating inquiry; and a great and useful work in this direction was carried out by them during the brightest days of the Saracen Empire. The modern world, indeed, owes much to their careful preservation of knowledge and their multiplication of copies of standard medical works before the era of printing, even though the science and art of medicine in itself did not, through their efforts, advance one step. In Avicenna we find a mind as keen as that of his great predecessors, viewing the human body and its ailments in his own way, although numerous points of resemblance to the works of Galen and Hippocrates are everywhere evident. He was not an experimenter so much as a philosopher, and the power of his mind over so many later centuries is probably to be attributed to his masterly grasp of all sciences, as well as of medicine and surgery. In the art of surgery he can hardly have attained the skill of the great founder, as far as can be judged by the records in the Canon. We do not find all those evidences of mastership in technique which shine so strongly through the writings of Hippocrates. As is characteristic of the Eastern to day, the knowledge which he possessed and, to judge by the records of his successes, utilized with great practical effect, was of a different order, both intuitive and logical, but intuitive before logical. His skill in dealing with fundamental mathematical problems is hardly surpassed at the present day, and in this respect he has been almost the only instance of a great mind applying mathematical concepts to medicine and surgery up till the present era.

Of other writers before the sixteenth century it is not unfair to say that they all, or almost all, were merely recorders, encyclopaedists it may be, but devoid of any spark of new thought or of wise generalization. They preserved with reverence the old tradition, and the ancient knowledge, they discussed every device, and, at interminable length, the meanings of the old scriptures; they tortured new meanings out of old phrases, they were diligent in dressing old words new, and their scholarship was judged by their ingenuity, or infinite prolixity, in so doing.

The Anatomists of the Renaissance.

The anatomists of the Middle Ages prepared the way for new enlightenment. The oldest treatise on anatomy comes from Egypt. The papyrus dates probably from the reign of Thutmosis I—that is, from before the crossing of the Red Sea by the Israelites. It shows the heart with vessels proceeding from it, the liver, spleen, kidneys, ureters and bladder. The first of comparative anatomists was Aristotle. The expedition of his pupil Alexander into Asia, which he accompanied, gave him unprecedented opportunities for the study of many animals; the result of his work is contained in several books. The first dissections of the *human* body were made by Erasistratus and Herophilus of Alexandria. Under the Ptolemies in Egypt were garnered all the fading philosophies and sciences which amid the dissensions and distractions of life in Greece could no longer flourish there. Alexandria then became the guardian and the host of all the sciences and the literatures of the world. It was here, as we have seen, that Galen learnt much of this anatomy.

After the darkness of succeeding centuries the first gleam of dawn was seen in the University of Bologna. For over one hundred years it had been renowned as a centre of scholastic knowledge, of literature, and of law. Mondinus, the father of anatomy as he is always acclaimed, lectured there between 1315 and 1325, and publicly demonstrated the structures of the body as disclosed by dissection. His descriptions are remarkable alike for their extent and their accuracy. The claim has been made for him that he went near to the discovery of the circulation of the blood, for he says that the heart drives or transmits the blood to the lungs. Two centuries later (1514–1564) was born the greatest of all anatomists, Andreas Vesalius, a native of Brussels, a student at Louvain. The difficulties of performing dissections were so great in France that he went to Italy for freer and larger opportunities. "My study of anatomy," he says, "would never have succeeded had I, when working at medicine in Paris, been willing that the viscera should be merely shown to me and to my fellow students at one or another public dissection, by wholly unskilled barbers, and that in the most superficial way. I had to put my own hand to the business." When 21 years of age he was asked to lecture at the University of Padua. His original additions to the science of anatomy were numerous and of the highest importance. He swept away much of the old "analogical" anatomy, the surmises and the errors, hoary with age, and sanctified by their free acceptance by a multitude of authors in the centuries after Galen formulated them. His work on anatomy is

adorned with illustrations which for beauty of design and accuracy of execution have never been surpassed, indeed I think not equalled, since they were published. It is said that the figures were drawn by Titian. Cuvier remarks that if this be not true they must at least be the work of one of his most distinguished pupils. But Vesalius did something more than all this. He was the first imitator of Galen in experimental work, and though he did little enough it sufficed to show that the method was not utterly forgotten. He was the forerunner of those distinguished Italian anatomists who may share with him the credit for the creation of the science of anatomy—of Eustachius, of Fallopius who in his short life laboured to great ends, and of Fabricius, his successor in the chair of anatomy and surgery of Padua, among whose pupils was William Harvey. The presence of folds in the interior of some veins had been noted by Sylvius and Vesalius and others, and those of the vena azygos were particularly described by Canani in 1547, but it was Fabricius who recognized the existence of valves throughout the venous system and who observed that they were all turned towards the heart.

Harvey.

Harvey had been attracted by the fame of Fabricius to Padua, at a time when Galileo was teaching, and was engaging in those methodical researches whose influences have lasted to our own day. Harvey said of himself that he felt it in some sort criminal to call in question doctrines that had descended through a long succession of ages and carried the authority of the ancients, but he "appealed unto Nature that bowed to no antiquity, and was of still higher authority than the Ancients." It was at the instigation of Fabricius that Harvey undertook by experiment to discover the function of the valve in the venous system, and in the year of Shakespeare's death those experiments, whose end was to bring about the greatest discovery in the history of medicine, were begun. The discovery had almost been made by half a dozen of his predecessors, who appeared to have stood upon its very brink. As Cuvier says, we are often on the edge of discovery without suspecting it. There can be little doubt that the pulmonary circulation had been recognized by the unhappy Servetus, who, with his works, was burnt as a heretic at Geneva in 1553 by Calvin.

In 1559 a pupil of Vesalius at Padua, Realdus Columbus, may be said to have suggested the existence of this circulation by inductive reasoning, but to ingenious speculation the minds of men were hardened. It was open demonstration and proof that were needed to press home an opinion so contrary to all accepted teaching.

A discovery is rarely if ever a sudden achievement, nor is it the work of one man; a long series of observations, each in turn received in doubt and discussed in hostility, are familiarized by time, and lead at last to the gradual disclosure of the truth. Harvey's discovery was finally due to his application of the experimental method of Archimedes and Galen to a problem of which many of the factors were already known; or, as he himself tells us, the circulation of the blood was held to be completely demonstrated by experiment, observation, and ocular inspection against all force and array of argument. He writes:

> "When I first gave my mind to vivisections, as a means of discovering the motions and uses of the heart, and sought to discover these from actual inspection and not from the writings of others, I found the task so truly arduous, so full of difficulties, that I was almost tempted to think with Frascatorius, that the motion of the heart was only to be comprehended by God. . . . At length and by using greater and daily diligence, having frequent recourse to vivisections, employing a variety of animals for the purpose, and collecting numerous observations, I thought that I had attained to the truth."

The reception of this discovery was generous at home, tardy and reluctant or openly hostile abroad; but it was everywhere eagerly and hotly discussed. Harvey says:

> "But scarce an hour has passed since the birthday of the circulation of the blood that I have not heard something for good and for evil said of this my discovery. Some abuse it as a feeble infant, and yet unworthy to have seen the light; others again think the bantling deserves to be cherished and cared for. These oppose it with much ado, those patronize it with abundant commendation."

Riolan, distinguished as an anatomist, and professor at the Collège de France, denied and derided it. What Harvey felt of the opposition may be learnt from his reply to a friend (Ent.), who urged upon him the publication of his later work, *De Generatione Animalium*:

> "And would you then advise me to quit the tranquility of this haven, wherein I now calmly spend my days and again commit myself to the unfaithful ocean? You are not ignorant how great troubles my lucubrations formerly published have raised. Better it is certainly at some time to endeavour to grow wise at home in private than by the hasty divulgation of such things to the knowledge whereof you have attained with vast labour, to stir up tempests that may deprive you of your leisure and quiet for the future."

Nevertheless, compensations and rewards came to him in full measure, and he had the satisfaction of living to see the general acceptance of his discoveries. This discovery, as Whewell said, implied the usual conditions, distinct general notions, careful observation of many facts, and the mental act of bringing together these elements of truth. Boyle wrote:

> "I remember that when I asked our famous Harvey what were the things that induced him to think of a circulation of the blood, he answered me that when he took notice that the valves in the veins of so many parts of the body were so placed that they gave a free passage to the blood towards the heart, but opposed the passage of the venal blood the contrary way, he was incited to imagine that so provident a cause as Nature had not placed so many valves without design; and no design seemed more probable than that the blood should be sent through the arteries and return through the veins whose valves did not oppose its course that way. That supposition his experiments confirmed."

Wiseman and Paré.

But the experimental method of Galen, revived by Gilbert, physician to Queen Elizabeth and the father of modern experimental science, and practised with such supreme effect by Harvey, was to find as yet no place in scientific surgery. That art, it is true, was practised with wider scope, with confidence bred of generations of experience, and with a risk that was perhaps steadily though almost negligibly diminishing. Safety was rather dependent upon the individual capacity of the surgeon than a quality common to the work of all. Richard Wiseman, who was born three years after the publication of Harvey's discovery, is generally granted the proud title of the father of English surgery. He was a man "given to the observation of Nature," and became Sergeant Surgeon to Charles II and to James II (who when Prince of Wales and Duke of York were withdrawn under a hedge, on October 23rd, 1642, during the battle of Edgehill, when Harvey distracted their thoughts by reading to them), and among his contributions to the craft of surgery may be mentioned his operations for hernia, and his advocacy of primary amputation in cases of injury, by gunshot or otherwise, of the limbs.

Ambroise Paré was to French surgery what Wiseman was to British. The life of Paré is one of the greatest romances in the history of our profession; it tells the story of the progress of the son of a joiner, who was groom, gardener, barber's apprentice, until he became the surgeon to four kings of France, and was concealed and spared from death by special order of Charles IX at the massacre of the Huguenots on the day of St. Bartholomew. For the king said it was not reasonable that a man who was worth a whole world of men should be murdered. He is the outstanding medical figure in the Renaissance. He was free from the trammels of ancient lore. When at last he read Hippocrates and Galen he surpassed them both in the number and variety of the conditions he had been called upon to treat; and he was therefore the better fitted to approach their teaching in the spirit of an informed and practised critic. "We must not be drugged by the work of the ancients as if they had known all things or spoken all," he writes. Yet he was said by Thomas Johnson, who translated and edited his works, to be "a man very well versed in the writings of the Ancient and Modern Physicians and Surgeons." He was one of the greatest original minds our art has known, fearless, independent, alert and inventive, and not without a good conceit. "There be few men of this profession," he writes, "which can bring so much authority to their writings, either with Reason or Experience as I can"; and again, "I have so certainly touched the mark whereat I aimed, that Antiquity may seem to have nothing wherein it may exceed us beside the Glory of Invention, nor Posterity anything left but a certain small hope to add some things as it is easy to add to former inventions." He won for surgery in France a place it had never before attained.

MORGAGNI AND HUNTER.

Surgery was still lacking its firm foundation in pathological anatomy. This was to be built by Morgagni and John Hunter and by many others taught and inspired by them. The tireless industry, unwearying care, and profound sagacity of John Hunter gave to an art that was largely empirical a warrant based upon a sound knowledge of morbid processes in all tissues. He was observer, investigator, collector, in each capacity without a rival. He was unceasing in his search for truth by way of experiment. "Don't think, try the experiment," he urged his pupil Jenner. In his own person he did both, supremely well. His disregard of the written word was deplorable no doubt; but refreshing after so much barren speculation among his forerunners. "I am not a reader of books," he said; and again, "I believe nothing I have not seen and observed myself." His rebuff to one who accused him of ignorance of the classics is famous: "Jesse Foot accuses me of not understanding the dead languages; but I could teach him that on the dead body which he never knew in any language, dead or living." Often he recounts the details of an experiment, but leaves us to draw the conclusion. He changed the whole spirit of practice and placed knowledge on the throne of authority. The day was gone for ever when a pure and dangerous empiricism could be practised; surgery became a science, and its craft a rational procedure. The museum which he founded, and which still bears his name, in the Royal College of Surgeons of England, is unsurpassed in all the world, and his own specimens are still to be seen to bear witness to his incomparable services to pathological anatomy. For Morgagni no praise can be too high. His letters may be read to day with delight; though his knowledge of disease is, in the modern view, often steeped in mediaevalism, his long array of facts and of relevant instances, his description of morbid parts, his accurate and searching generalizations are among the greatest contributions to medical literature in all the ages.

LISTER.

Such was the progress of surgery up to the early years of the nineteenth century. The discovery of the anaesthetic properties of ether and choloroform completely changed the possibilities of the range of application of surgery to morbid conditions, and enlarged also the scope of experimental work upon animals. But in every direction the surgeon's work was hampered and frustrated by the occurrence of infection and all its dire consequences in the majority of the wounds inflicted. It was for Lister that the world was waiting.

Lister, as everyone knows, introduced the antiseptic system into surgery. Before his time the wounds inflicted by the surgeon, or those received in civil life as in cases of compound fracture, became septic almost as a matter of course. The decomposition of the wound discharges was formerly held to be due to contact with the oxygen of the air. Lister recognized that the investigation of many observers, ending with Pasteur, which showed that fermentative and putrefactive processes depended upon minute organisms, were applicable in surgical work also. In the year 1836, a French observer, G. Latour, had pointed out that the tiny particles of which yeast was composed were capable of multiplication, that they were in fact alive, and that it was by their propagation that the change known as fermentation, the change of sugar into alcohol, was produced. Both Latour and T. Schwann showed that this process could be suppressed by the application of heat to the yeast. Schwann especially called attention to the fact that the putrefaction of organic substances was due to these minute living bodies, and that putrefaction and fermentation were essentially one. The weighty authority of Liebig was opposed to this view, and Helmholtz, after a time of wavering, finally ranged himself against Schwann. It was in 1856 that Pasteur began the series of experiments which demonstrated finally that micro-organisms were the cause of fermentation and of putrefaction, and that for each form of fermentation studied by him—yeast fermentation, lactic acid fermentation, butyric acid fermentation—there was one specific cause, and one only.

Lister had long been working on the problem of inflammation and of the decomposition of wound discharges. When, therefore, early in 1865, he read of the work of Pasteur, his mind was prepared to receive the new evidence, and to put it to the proof in the treatment of surgical cases. It is impossible for us now to realize the horrors and the mortality attached to surgical work at the period when Pasteur's papers were written. In almost every case the discharge from a wound underwent putrefaction; inflammation of varying degrees of severity attacked the wounds, pus poured from their surfaces, and hospital gangrene, erysipelas, and pyaemia, the most desperate form of blood poisoning, occurred with terrible frequency. The clean healing of a wound by "first intention" rarely occurred. A surgeon was more than content—he was eager and gratified—to see a thick creamy discharge of "laudable pus" from the surfaces of a wound. Very few operations were performed, and then as a general rule only in cases where death or extreme disability was otherwise certain. Limbs were amputated when smashed or so diseased as to be worthless and dangerous; the mortality from amputations varied from 40 to 50 per cent. In Lister's hands, up to the year 1865, in 15 cases of excision of the wrist-joint by his own method, 6 patients suffered from hospital gangrene and one died from pyaemia. Volkmann, one of the earliest of Lister's disciples, had results so ghastly that he decided to close his hospital altogether for some months. Lister's own account of his wards at Glasgow is disturbing and distressing even to-day. The most vigorous and robust patients were swept away after the most trifling injuries or operations, and septic diseases were so frequent and so deadly that the very name of hospital was dreaded by every sufferer. John Bell, a great surgeon, spoke of the hospital as a "house of death."

In the paper which Lister had read Pasteur asserted that "the most far-reaching of my researches is simple enough; it is that putrefaction is produced by living ferments." He asserted that the oxygen of the air was not the cause of putrefaction, as everyone hitherto had supposed; that, indeed, some of the causes of decomposition could thrive only in the absence of oxygen. This observation, which distinguishes "aërobic" from "anaërobic" organisms, is of the first importance. Lister at once realized the significance of this work in connexion with the changes occurring in wound discharges and on wound surfaces. In 1867 he wrote:

> "When it had been shown by the researches of Pasteur that the septic property of the atmosphere depended, not on the oxygen or any gaseous constituent, but on minute organisms suspended in it, which owed their energy to their vitality, it occurred to me that decomposition in the injured part might be avoided, without excluding the air, by applying as a dressing some material capable of destroying the life of the floating particles."

He proceeded to make trial of the hypothesis in his own work. At this time he had heard also of the experiments made at Carlisle with the disinfection and deodorization of sewage by German creosote, a crude form of carbolic acid. The administration of a very small proportion of this substance not only prevented all odour from the lands irrigated, but destroyed the entozoa which usually infest cattle fed upon such pastures. This was the preparation he decided, after trying chloride of zinc and the sulphites, to rely upon in his early trials.

Among surgical cases then, as now, the sharpest distinction was drawn between simple and compound fractures—between fractures, that is, where the soft parts are almost unhurt and the skin unwounded, and fractures in which a wound through the skin and soft tissues reaches the broken ends of bone. In simple fractures life was rarely or never in jeopardy; in compound fractures putrefaction of wound discharges occurred, septic processes became rampant, and the mortality was high. "The frequency of disastrous consequences in compound fractures, contrasted with the comp'ete immunity from danger to life or limb in simple fracture, is one of the most striking as well as melancholy facts in surgical practice." These were the opening words of Lister's first paper on the "new methods" in the *Lancet* of 1867. The first trial of this method proved disastrous, owing to improper management, but the second attempt, on August 12th, 1865, proved perfectly satisfactory, and was followed by others which more than realized Lister's most sanguine expectations. Compound fractures healed and united as easily and quickly, and almost as safely, as simple fractures. The method proved by so stern a trial was soon applied to cases of chronic abscess and by degree to operation wounds. In one of his earlier

papers Lister wrote: "Admitting, then, the truth of the germ theory, and proceeding in accordance with it, we must, when dealing with any case, destroy in the first instance, once for all, any septic organisms which may exist within the parts concerned; and after this is done, our efforts must be directed to the prevention of the entrance of others into it." This statement shows that Lister laid down the two essential principles of the antiseptic system—the prophylactic and the therapeutic.

Lister's work, it is evident, was the result of research carried out both by the inductive and by the deductive method, and tested and confirmed by many experiments. He combined in full measure the wide, patient, penetrating inquiry, the comprehensive generalization, and the sound wisdom of the method of Hippocrates with the demand for experimental illumination or proof afforded by the method of Galen, of Bacon, and of Harvey. He combined in his own work the best of all the schools, and it was no accident that the greatest of all discoveries relating to the science and the art of surgery was made by him.

If a man's services to humanity are the standard by which we measure his value, then Lister may be counted as perhaps the greatest man the world has ever produced. For he has been the means of abolishing, or assuaging, the sufferings of men and women to a degree which is quite incalculable, and, as I said of him years ago, he has been the means of saving more lives than all the wars of all the ages have thrown away.

Clinical Research in Surgery.

As the result of Lister's work the way was cleared for an immense and immediate advance in surgical practice and for an extension into regions that before had been denied even to the most intrepid surgical adventurer. The result is known to all the world. Diseases which were beyond the reach of any are now within the grasp of all surgeons. Operations whose mortality even twenty-five years ago was so heavy as to be almost prohibitive are now performed with a frequency and with a degree of safety which never cease to excite our wonder. But Lister's work did something else: it showed how research for the future must be conducted if our progress were to be both enterprising and safe; it showed that clinical research and experiment must for ever run together.

The achievements of clinical research have been gigantic since Lister's day. The safety which he brought into all our work resulted in an advancement, little by little, of the attack upon the diseases of internal organs, and it exercised in consequence a very powerful germinal influence upon internal medicine. If our knowledge of the diseases of the abdominal viscera of thirty years ago is compared with that of to-day the truth of this statement will appear. In connexion with the diseases of the gall bladder and bile ducts the work of Courvoisier, published in 1890, is a complete record; it is, indeed, one of the most monumental works ever produced in surgical literature. What was known then in comparison with now? Nothing of the early symptoms of gall stones, of the relation between them and visceral and other infections; nothing of the symptoms due to the impaction of stones in one or other of the ducts; almost nothing of the possibilities of safe relief by surgery. Lister's work has not only been the means of relief to the patient in his agony, but has been the instrument by which our own most prolific inquiries into the symptomatology, etiology, and in no insignificant degree the pathology of this disease has been made. Of gastric ulcer, as distinguished from cancer of the stomach, our knowledge thirty years ago was trivial compared with what it is to-day. Much of the teaching of those days is not confirmed by the surgical inquiries of to-day; and it is now, I suppose, admitted universally that unless the physician is guided by the principles of diagnosis discovered by the surgeon and the radiographer he will stray wide from the path of truth. So, too, of duodenal ulcer, our present knowledge of which is due entirely to the clinical research made possible by safe surgery. And the list might be greatly extended. Much more remains to be done. We are only on the threshold of our inquiries as to the complementary actions of one organ upon another; of the relations, for example, of the pancreas, spleen, and liver to each other; and of all or any of these to parts or to the whole of the alimentary canal and to the organs possessed only of an internal secretion.

Clinical research involves and implies the fullest inquiry into the detailed character of all present symptoms; the most searching pursuit after those earliest departures from smooth and normal action which observation can discover, the correlation of all these with the manifest changes observed at all stages in the several organs during operations upon any of them. When all this knowledge has slowly and patiently been garnered, then the method of experiment must be used to carry our inquiries still further, and to help us to answer the question, "How do these things happen?" Clinical research will tell us of the changes in other organs associated with the one to which our main inquiry is directed, but a process of deduction and an inquiry by experiment are necessary before we can disclose the sequence of events which culminate at last in the disease we set out to study.

The clinical research is beyond question the more arduous. The factors which enter into it are so many, so variable, so impressed by the changing conditions and moods and circumstances of the patient, that only the most indefatigable patience and the most trained capacity can help to resolve the matter into simple terms, to dissociate what may be an infinitely complex grouping of many facts before we can rearrange them in appropriate sequence of process or of time. We must discover the "usual conditions," obtain our general notions, observe carefully a multitude of facts, arrange them in orderly fashion, and employ the mental act which will bring them together as elements in a great truth. When this is done, and only when this is done, can the deductive method of Galen be employed to fullest advantage. Experimental research is not so baffling a task. Great ingenuity in the devising of experiments may be found in the supreme masters, Pavlov, Almroth Wright, and a very few others. But each experiment often contains only the one question to which the answer is sought. The answer is "Yes" or "No," or is expressed in simple terms, and it is free from those infinite perplexities and changing proportions which distinguish the answer given to any inquiry, even the simplest, in the method of clinical research. When in a simple experiment the answer is given, a new problem may arise suggesting a further experiment. Thus a chain of experiments may develop each of which answers, not only its own question, but contributes in its own degree to the final answer embracing the entire sequence of experiments. The single experiment may be simple. But in respect of a series, each member of which is dependent upon its predecessor, and provokes its successor, and all of which illuminate or decide some problem suggested by clinical research, nothing has been done in surgery comparable to that which in chemistry has been achieved by Fisher and by Abderhalden.

These brief glimpses at the progress of surgery show that its past epochs may be considered as three in number.

I.—In the first and longest the writings of Hippocrates and Galen were regarded as an inspired gospel. By them the minds of men were held captive and their imagination enslaved, and every new adventure in thought or action suppressed or cramped. To seek in them for knowledge was all the effort of every man. What was written in them was truth, what was outside them rank heresy. Where the meaning was not as plain as day the most endless inquiry and discussion ensued. The controversies which then shook the intellectual world to its very foundation are seen now to be only laughable both in their methods and in their quaint decisions. In later ages to challenge the truth or the final revelation of any teaching of Galen's was almost blasphemous, and it required a rare and reckless courage to say, as did Henry of Mondeville, "God did not surely exhaust all His creative power in making Galen." The prophets and seers, who little by little and with very needful caution led the world through this black night, death's second self, into the dawn, were the anatomists, Mondinus, Vesalius, Fabricius, Fallopius, and others. By their work the assertions of the old scriptures could be openly gauged. In gross anatomy a structure stands out for all to see. If Galen's teaching denied the truth disclosed by dissection, it was most gently and tentatively refuted, heretical and perilous as such a work might be.

II.—As normal anatomy grew it was joined by morbid anatomy, and at last came Morgagni and Hunter. They established the second great era, in which the pathology of the dead was studied with a wealth of care and inexhaustible patience. The gross lesions of morbid anatomy, and even many that were recondite and remote, were examined, described, discussed, and arranged in due order by a mighty succession of able men whose work to-day we too lightly neglect. Clinical medicine and surgery were dominated by the knowledge of the morbid processes discovered in this time. Symptoms were correlated with the signs found upon the *post-mortem* table and upon the shelves of museums. Clinical histories were largely devoted to terminal conditions, for it was only these that brought a patient to a hospital, where he died and where an autopsy could be made. But patients do not die in hospital from the diseases from which they suffer long during life. And in consequence severe limitations were set to our knowledge of disease of all kinds.

III.—Lister's work made possible the third era, which depended for its swift and notable advance upon a study of the pathology of the living—upon a study, that is, of morbid processes in their course rather than when their race was fully run. By multiplying observations made during operations we learnt, little by little, how to capture a general truth from a series of individual examples. By slow degrees, and grudgingly, it was admitted that terminal manifestations of disease and the advanced ravages of morbid anatomy did not constitute all medicine; that earlier symptoms were to be referred to earlier changes in organs exposed during the course of operations. And these changes and symptoms we now realize are themselves but late; still earlier manifestations of aberrant action are being sought patiently and with a success that holds increasing hope for future work.

Experimental Research in Surgery.

During all these three periods, through Galen, Vesalius, Harvey, Bacon, Hunter, Lister, there has run a vein of experimental work, testing hypotheses and discovering new truths. Since Lister's day there has been a steadily increasing recognition of the value of such work and of the urgent necessity of continuing it, of enlarging its field so that it may be coterminous with medicine itself. We are, indeed, newly entered upon another stage—the stage of combined research—in which clinical observation, inductive and deductive processes of reasoning, and experimental inquiry are linked together. In its progress, so far, the work of a few men stands out as of the utmost significance: Horsley's work upon myxoedema, cretinism, and on the functions of the thyroid gland; Ferrier's, Macewen's, and Horsley's researches upon cerebral affections and cerebral localization; Senn's work upon the pancreas and upon the intestines; Kocher's work upon cerebral compression and upon the thyroid gland; Crile's work upon shock and upon blood transfusion; and Harvey Cushing's work upon diseases of the brain and the pituitary gland. Since Lister rid all operations upon man and upon animals of their former terrors many surgeons have turned to experiment in order to perfect and to illustrate their own work, to test a hypothesis, to search for new procedures, or to discover an explanation of clinical phenomena whose meaning was difficult to unravel. In recent days few men have displayed so vast a range of clinical interests, so keen a zest for relevant experimental inquiry, so logical a mind, such frank intellectual honesty as Murphy. He may justly be ranked as one of the earliest and one of the greatest exponents of the method of combined research.

Murphy's Combined Research.

Murphy's first work to attract the attention of all surgeons was that which led him to devise and to perfect the most exquisite surgical implement that has ever been invented—"Murphy's button." Up to the time at which experimental work on the anastomosis of hollow abdominal viscera was begun by Senn, Murphy, and others, the method of securing union was difficult, tedious, and unsafe. I well remember to have seen the operation of "pylorectomy" done in the year 1889. A very niggardly removal of a small "prepyloric" carcinoma was made, and the cut end of the duodenum was united to a part of the divided end of the stomach after the first method of Billroth. We counted over two hundred sutures used to effect the junction. Each suture was of silk; for each the needle was separately threaded, the suture passed, tied, and cut—a wearisome total of movements of the surgeon and his assistants, involving a great expenditure of time. No wonder the surgeons searched for simpler methods. Senn's bone plates, the first mechanical apparatus to assist in an anastomosis, were ingenious instruments not very easy to use, requiring a not inconsiderable degree of skill and patience to secure that the threads holding them were well and truly tied, and calling also for the introduction of a number of additional sutures. The results following the use of these instruments were sometimes very good and sometimes very bad. While surgeons were struggling with this tiresome and unsatisfactory implement Murphy introduced his "button." It was the result of a great deal of experimental work done upon dogs, in the early hours of the morning, and in the lean years of his early married life. In this work Mrs. Murphy took her share, giving chloroform to the animals. A few people were privileged to know of the boundless help and inspiration which Mrs. Murphy gave to her husband in those hard but happy days when he was struggling for his place in the world of surgery. His wonderful success was in no small way due to her sympathy, encouragement, and unfaltering belief in him, and to the eager enthusiasm which she showed in all his works. With the help of Murphy's button operations which had been difficult and perilous at once became so simple that the merest tyro could perform them, and the risk of all operations fell with amazing rapidity. The button was used in every clinic, and upon all occasions where visceral anastomoses had to be effected; and the name and the fame of Murphy travelled round the world.

But I still think that the great virtue of the button was not in its own direct use, but in the convincing demonstration it gave to us of the essential simplicity of the process of visceral union. By using the button we learnt how safely and how rapidly the peritoneal junction took place; there was no need, it was now perfectly evident, for the hundreds of stitches that all surgeons were using. Firm even approximation for a very few days would, the button proved, lead beyond a doubt to a permanent and secure fusion of the apposed viscera. The button itself was occasionally a danger. After the operation of gastro-enterostomy it sometimes remained for many months in the stomach; when it passed on to the lower intestine it might cause obstruction, or it might ulcerate its way through the intestinal wall. We learnt from the use of the button, not that the button itself should be used, but all the secrets of the principles of entero-anastomosis. It is not the least exaggeration to say that Murphy revolutionized the methods of visceral anastomosis, and was partly responsible for giving that impulse to abdominal surgery which in later years has carried it so far.

A characteristic example of his method of approaching a surgical subject to which he desired to contribute is shown in his work on *Ankylosis*, which he began in 1901. Up to that time the treatment of stiff joints was unsatisfactory, and in cases of severe ankylosis, whether bony or densely fibrous, was almost hopeless. Murphy says he proposes to begin the study of his subject by asking some questions:

> "What are joints? What is the embryology of joint formation? What is the pathological histology of acquired arthroses of false joints? What is the pathology of hygromata (acquired endothelial lined sac)? Can they be produced artificially? What is ankylosis? What are the pathologic and anatomic changes included in the term? What tissues are involved? From a practical standpoint, into what classes may it be divided? When ankylosis has formed, what are the limitations of surgery for its relief? Can we re-establish a movable, functionating joint with synovial lining? Can we restore motion, and to what degree? In what class of cases can the best results be secured? Can we for the future promise better than the flexible fibrous unions that we have secured in the past?"

He then discusses the development of joints in the embryo, and the method of bursa formation in early and in adult life, shows that hygromata and ganglia are the products of the liquefaction of hypertrophied connective tissue, and indicates that in an artificial development of joints all the facts relative to these processes should be utilized. The formation of "false joints" as a result of non-union in fractures of the long bones led to the recognition of the pathological condition whose counterpart was

provoked in the operation of arthroplasty, in which a foreign body was inserted between the ends of bones separated at an ankylosed joint, to prevent reunion and to cause the development of a new joint. He then investigates the matter by experiments upon dogs, and proceeds to demonstrate its efficacy upon men afflicted by bony ankylosis of their joints. The whole piece of work is an exemplary instance of the combination of clinical experience and of experimental research leading to the establishment of a new method of treatment in a severe and most disabling condition.

In 1897 Murphy published his article, "Resection of arteries and veins injured in continuity: end-to-end suture: experimental and clinical research," in which, for the first time, he established the principles and described one of the methods of arterial suture and anastomosis. As in other articles, clinical needs indicate the lines of his experimental inquiries, and a widening of the bounds of surgical endeavour and practice is the result. In 1898 he delivered at Denver the oration on surgery before the American Medical Association, and chose as his subject the "Surgery of the lungs." Independently of Forlanini he suggested the injection of nitrogen into the pleural cavity in cases of hopeless unilateral disease of the lung. No enthusiastic acceptance greeted the suggestion. Murphy himself extended the method in his later work to cases of incipient tuberculous disease; and recent experience has fully justified all his claims and has given sanction to his methods. He again combined clinical experience and research by experiment in his work on *Surgery of the Spinal Cord*, published in 1907, and his final summary on neurological surgery, in *Surgery, Gynaecology, and Obstetrics* [1907, iv, 385], was the most accurate and concise survey of our knowledge of this subject which had then been published.

Wherever we turn we find his method to be the same: A wide survey of the subject to be discussed made interesting by the personal magic that he was able to throw into it; a disclosure of the gaps in our knowledge; a suggestion as to the means by which that knowledge or a want in our technical methods can be made good; a record of experiment to elucidate or to solve a difficult point; a wealth of clinical observation and a formidable array of arguments, lead to an inevitable conclusion stated in terms that none could fail to comprehend. In every article of his that we read we can see the working of an orderly mind, of a mind most eager for new truths and expectant of them. For every subject he seems to have a mental scaffolding by which he guides and arranges the truths as they are fashioned and duly laid in place. He had a zeal for classifications which looked complex but when carefully considered tended to simplicity and to easy and ready remembrance. Of his other surgical work and of his high-minded endeavour to seek for and to secure the purity and advancement of his own profession I need say nothing. It is a record of sincere and honest devotion to his duty as he saw it before him. Great deeds are born of great zeal and high resolve, and he was lacking in neither. All that he did is within the recent memory of his colleagues here. My immediate purpose has been fulfilled if I have sketched, however roughly, the giant figure of the man and the surgeon, whose work was done among you and whose fame has spread out into all lands.

Our calling, by common consent the noblest of any, dignifies all who join its ranks. The honour of the profession is the cumulative honour of all who, both in days gone by and in our own time, have worthily and honestly laboured in it. In every generation there are a chosen happy few who shed a special lustre upon it by their character, their scientific attainments, or the great glory of their record of service to their fellow men, for it is, as Ambroise Paré said, "beautiful and the best of all things to work for the relief and cure of suffering." In our generation Murphy was one who by his full devotion, his complete surrender to its ideals, and by his loyal, earnest, and unceasing work added distinction to our profession, which in return showered upon him the rewards with which no others can compare—the approbation of his fellow workers, and the friendship and trust of the best among his contemporaries in every country.

> The mightier man, the mightier is the thing
> That makes him honoured.

As we look backward upon the long history of the science and the art of medicine we seem to see a great procession of famous and heroic figures, each one standing not only as a witness of his own authentic achievements, but also as a symbol of the traditions, ideals, and aims of the age which he adorns. The procession is sometimes thinly stretched out, or even rudely broken here and there, but in happier ages it is thronged by an eager and exultant crowd. In medicine the whole pageant is as noble and splendid as in any of the sciences or arts, and it reveals the collective and continuous genius of a band of men inspired by the loftiest purpose and lavish in labour and sacrifice for the welfare of mankind. They have come throughout the ages from every land. They now belong not to one country but to every country, for they are the common possession and the pride of all the world. They have lost their nationality in death. They are men whose deeds will not be forgotten, and whose names will live to all generations. In that great order of men, small in numbers, supreme in achievement, the unerring justice of Time will reserve an assured place for John Benjamin Murphy.

EIGHTY-EIGHTH ANNUAL MEETING

OF THE

British Medical Association.

Held at Cambridge June 30th to July 2nd.

PROCEEDINGS OF SECTIONS.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

Professor J. LORRAIN SMITH, M.D., F.R.S., President.

INTRODUCTORY REMARKS BY THE PRESIDENT.

PROFESSOR LORRAIN SMITH outlined the scope of the discussions in the Section. Pathology was, he said, becoming more and more divided into special branches, and one person was not able to devote himself to every branch. At the same time the subject was essentially one. Morbid anatomy, bacteriology, and experimental pathology supplemented each other, and complete solution of a problem was not possible by investigating it along one line alone. Morbid anatomy laid the foundation, bacteriology followed, demonstrating the cause of the lesions, and experimental pathology would complete the other two and define the principles of the rational treatment of the disease. In many diseases studies made from all three points of view dovetailed into each other, so that a complete picture of the condition was obtained. In others, as for instance encephalitis lethargica, morbid anatomy had been worked out, but the bacteriological investigations were still incomplete. Laboratories were too often equipped only to assist the clinician. When a diagnosis had been established, too often the matter was dropped. The pathologist should aim not only at establishing a diagnosis by bacteriological or *post-mortem* examination: he needed to study the fundamental conditions which produced the disease. For instance, if he found a tuberculous lesion in the suprarenal, he should not rest content with a diagnosis of Addison's disease. He wanted to know why the tubercle bacillus selected a particular organ in any given case, and why the individual was vulnerable to its attack. He should be in a position to make a complete investigation of disease. The reconstruction of pathological departments should be attempted along lines that would enable this ideal to be fulfilled.

DISCUSSION ON ATROPHY OF THE LIVER.

OPENING PAPER

BY

JAMES MILLER, M.D., F.R.C.P.Edin.,

AND

ANDREW RUTHERFORD, M.B., Ch.B.Edin.

THE material which forms the basis of this communication consists in a series of fifteen cases of liver atrophy as yet unpublished. They have occurred partly in our own

experience (two of the cases occurred in India); in large part they are cases which have been under treatment at the Edinburgh Royal Infirmary and Sick Children's Hospital, and which have been incorporated in the teaching material of the pathological department of the University. We have much pleasure in recording our indebtedness to Professor Lorrain Smith and to several members of the medical staff of the two hospitals for permission to utilize the cases.

Types of Liver Atrophy.

They form a fairly complete series, illustrating, as we think, the various stages of a disease which, although it may have no constant etiological factor, represents a well-defined pathological entity. Although gradations between the stages are met with, three more or less distinct types of the disease occur, and these are as follows:

1. The acute type, characterized by more or less complete destruction of the liver parenchyma and with the minimum of reaction. The liver is small, shrunken, and yellow or yellow-brown in colour. This represents the old "acute yellow atrophy." Of this type we have two cases, and there is a third case which is intermediate between this and the next type.

2. The subacute type, in which there is a well-marked vascular and inflammatory cell reaction and a proliferation of the smaller bile channels. There is also an early connective tissue reaction spreading from the portal tracts. The liver in this type is still atrophic, but is red or reddish-brown in colour. Inasmuch as there are usually patches of the more acute stage left, the organ presents a parti-coloured appearance, being a mixture of red or brown and yellow or green areas. Of this type we have three cases, and we have had an opportunity of referring to three others already published.

3. Thirdly, there is the type in which regeneration is the predominant feature, and the organ, which shows adenomatous nodules of liver tissue in a stroma of fibrous tissue, is small or large according to the degree and extent of this regeneration. Between the most advanced and long-standing examples of this type and common so-called alcoholic cirrhosis of the liver there is no hard-and-fast line either from the point of view of pathogenesis or of the final clinical picture. As, however, the age incidence is different, and possibly the causation, a separate term seems justified. We have adopted for this type a term which was first suggested, we believe, by Johannes Orth and used by Marchand, Barbacci, Robert Muir, and, more recently, by a number of Continental and Japanese writers. The term is multiple nodular hyperplasia. There is always an objection to the introduction of a new term, but this is already in use; it is descriptive of a fairly well-defined morbid entity, and the time-honoured term cirrhosis has led to confusion rather than simplification.

It would appear that in the past there has been much confusion, especially in children and adolescents, as between ordinary atrophic cirrhosis and the so-called "subacute liver atrophy," for which we now propose the term "multiple nodular hyperplasia." Cases of this kind met with in children have frequently been referred to and regarded as simply fibrosis of the same variety as is encountered in common alcoholic cirrhosis in elderly adults. We are prepared to concede the great difficulty in differentiating the most advanced cases of this nodular hyperplasia from those of "alcoholic" atrophic cirrhosis, but in the former the nodules are larger, having a smooth surface, and the intervening fibrous tissue is more vascular and in consistence softer. It also varies in amount in different parts of the organ, due to the mode of regeneration.

As between the term "subacute liver atrophy," the name hitherto universally employed in this country, and the term which we suggest, the former may be, as already indicated, more appropriately applied to those cases of liver atrophy where the most notable change is diffuse destruction of parenchymatous tissue, and where the duration of illness is somewhat longer than in the acute fulminant types which last only a very few days. In what we would term "multiple nodular hyperplasia" the most striking change is the hyperplasic and regenerative rather than the atrophic and destructive one, and the clinical course is chronic.

In summarizing the cases from the etiological standpoint one must distinguish clearly between conditions which may be accountable for the liver atrophy and those which are complications of the disease. For instance, two cases in the series had scarlet fever some considerable time previous to their death which might conceivably have been the cause of the initial liver atrophy. Another case died of scarlet fever, her liver being in the condition of multiple nodular hyperplasia. The scarlet fever could therefore have had no bearing upon the liver atrophy there. On the other hand, the finding of a tuberculous lesion may always have some bearing upon the causation even when occurring as a concomitant of the later stages.

As is well recognized, there is no single etiological factor in acute atrophy. Several conditions have been suggested as possible causes: such as tuberculosis, syphilis, typhoid, and influenza. A striking point is the frequency with which one is presented in the history with a number of options. For example, in a case published by one of us in 1908 the patient had had scarlet fever seven years previously, acute rheumatism shortly after this, syphilis six months before death, and influenza two months before death. There was also active pulmonary tuberculosis found *post mortem*.

One of our present series had syphilis as a possible element (there being a history of repeated miscarriages in the mother), measles seven years previously, tuberculosis of cervical glands six years previously, and influenza a year before death.

It would seem that in some cases we may have a single virulent poison causing complete destruction of the liver; in others, a whole series of repeated attacks on the liver parenchyma.

Etiological Factors.

Analysing our series from the point of view of possible etiological factors we get the following:

Tuberculosis.—There is *post-mortem* evidence or a history of tuberculosis in 9 out of the 15 cases. Of the 9 cases, 5 showed active tubercle present at the autopsy; one of these was renal, the other four mesenteric gland infections. In a case of "subacute liver atrophy" recorded by Dingwall Fordyce in 1909 there was tuberculous ulceration of the large bowel.

Syphilis.—Definite evidence was obtained in two acute cases. In two others there were in the history points which suggested syphilis. In one of the definitely syphilitic cases a course of five injections of an arsenical compound had been administered.

Influenza.—This was a fatal complication in two cases, and there was a history of a slight attack in one other.

Typhoid or *paratyphoid infection* was associated with two cases; in one the attack had been nineteen years previously, in the other the association was quite recent.

Scarlet Fever.—A history of this disease was obtained in two cases, and in another case it was a terminal complication.

In one case there had been three attacks of chorea.

Amoebic dysentery was present in one acute case.

In every instance a history of some infective disease was obtained except in circumstances where, for some reason or other, a full history could not be obtained.

Distribution of the Degenerative Change.

The changes by which the liver parenchyma disappears show no special tendency to occur in any particular part of the lobule. Any area or areas of the lobule may be the seat of selection. It should be noted, however, that in certain of the subacute cases, as seen by the naked eye, the peripheral portions of the organ—those in relation to capsule and stroma—seem to escape. Attention has been drawn to this distribution in a case published in 1914 by E. C. Dickson.[1] The evidences of reaction, vascular dilatation and haemorrhage as well as inflammatory infiltration and bile duct proliferation, show a similar relationship to fibrous stroma. Further, regenerative nodular formations in cases of longer duration seem in certain instances to be similarly disposed, as indicated by staphyloid grouping of the adenomatous nodules in proximity to portal tracts.

Results, etc.

Liver atrophy or its results may prove fatal either in the acute, subacute, or chronic stages. In the two former the fatal element is probably destruction of liver tissue. In the last it is usually an intercurrent infection. We consider it possible for patients to survive very extensive destruction of liver tissue. One of our series supports this view, showing as it does widespread destruction of liver tissue with very limited regeneration. They may not, however, survive very long. Once a well-marked nodular

[1] *Amer. Journ. of Diseases of Children*, vol. viii, p. 357.

hyperplasia has been established it would appear that the patient can live for an indefinite period provided no severe intercurrent infection occurs. He may or may not exhibit hepatic symptoms while he survives.

In answer to the question whether the cases of multiple nodular hyperplasia go through a stage of acute or subacute atrophy, we would say that the previous histories of several of our series makes it appear doubtful as to whether they have ever passed through an initial preceding stage of acute widespread liver destruction. The suggestion is rather that of a repeated series of limited attacks of subacute intensity on the liver parenchyma.

Mode of Regeneration.

The series investigated indicates this as occurring from two aspects: firstly, from surviving liver cells, which we consider is the usual process; secondly, from the small bile duct like structures which have proliferated. This latter method probably rarely results in nodular formation of any significance; but we have frequently observed a process of linking up of bile canaliculi with liver cell columns. It would appear possibly to be an effort to supply to the new liver tissue a channel of excretion.

Bernard H. Spilsbury, M.B., B.Ch.,
Lecturer in Morbid Anatomy and Histology, St. Bartholomew's Hospital.

It is not uncommon to meet with cases of infective or toxic processes where recovery from the immediate effects occurs, but the patient afterwards succumbs, it may be in a few weeks or months or many years later, from the effects of the damage produced by the active process.

Among the disabilities which accrue, that which results from the formation of scar tissue is the first in importance. The property which such tissue possesses of contracting gradually and for a long time after its formation leads to very varying results—such as stricture formation in passages and ducts, interference with the functions of contractile organs, such as the intestines, by peritoneal adhesions, the production of post-meningitic hydrocephalus, and the compression atrophy of solid viscera when they are penetrated or surrounded by scar tissue.

On investigation of the morbid processes in the liver many conditions are found in which atrophy of the parenchyma results from the contraction of scar tissue formed in the course of an inflammatory or toxic process. When the contracting tissue involves a large part of the organ, disturbance of the function of the liver may be responsible for a fatal issue.

One of the common morbid processes is multilobular cirrhosis of the liver arising generally from prolonged alcoholic excess. In the atrophic form the liver may be reduced to less than a half of its normal size and of that fraction a part consists of fibrous tissue. This tissue contracts and slowly compresses the liver parenchyma enclosed in its meshes, producing progressive atrophy of the liver cells. Microscopical examination may fail to show any active inflammation in the organ, or such slight reaction as occurs when the compressed liver cells pass from atrophy to necrosis.

Occasionally pressure atrophy is produced by chronic perihepatitis—as in this specimen—in which the organ is completely encased in a thick layer of dense fibrous tissue which can be partly stripped from the original capsule and which has produced by its contraction some pressure atrophy in the organ.

In congenital syphilis atrophy of the liver cells is a constant and marked feature of the active disease in infancy. When the disease is arrested or cured the effects of previous inflammation may still be evident. When some parts of the organ have been severely damaged, other large areas having escaped, the contraction of the fibrous tissue formed in the damaged parts brings about pressure atrophy of the included liver cells and leads to the production of areas of puckered scarring, the undamaged areas showing a great capacity for compensatory hypertrophy. Some of the very misshapen livers seen occasionally in the *post-mortem* room may be accounted for in this way.

When the active disease causes severe damage to the greater part of the organ, the contraction of the resulting scar tissue, if the child recovers, may result in a fairly uniform cirrhosis of the liver with atrophy of the cells.

This specimen of cirrhosis of the liver from a child aged 15 years, showing, as is often the case, a very coarse form of the disease, is probably a late manifestation of congenital syphilis.

In acute yellow atrophy of the liver—so called—the process is essentially a toxic degeneration of the liver cells with areas of necrosis, and it is seldom that the patient survives for a sufficient time for fibrosis to occur in the organ. Fibrosis has been found, however, in the subacute form of the disease, and the contraction of scar tissue, compressing the liver parenchyma and leading to atrophy the cells, may in part account for the fatal result in such of cases.

Allied to acute yellow atrophy are the industrial diseases which produce their effects chiefly upon the liver. I refer to poisoning by tetrachlorethane, trinitrotoluene or T.N.T., and dinitrobenzene, and other allied substances. Much has been learnt of the effects of these poisons on those who were exposed to their action in munition factories during the recent war. All these poisons produce rapid necrosis of the liver cells where their action is most intense, and fatty degeneration, which may end in necrosis of the cells, where the action is less marked. Poisoning by these substances may prove fatal so rapidly that microscopical examination will show only degeneration and necrosis of the liver cells.

Cases in which death occurred after a longer period of illness showed the production of fibrous tissue in the liver, and in a few of the most prolonged of the fatal cases compression atrophy by fibrous tissue of the liver substance which remained was evident on microscopical examination.

This atrophic change was very pronounced in the first case described in this country of poisoning by tetrachlorethane, brought about by the inhalation of the vapour from the "dope" used in the varnishing of aeroplane wings, which contained this substance as one of its ingredients. No cases of dope poisoning occurred after the exclusion of tetrachlorethane from the varnish.

The duration of the illness in this case was about two months. The liver was much reduced in size, and weighed 32 oz. On microscopical examination of the organ the remaining liver tissue, which had either been unaffected by the poison or had recovered from the effects, showed an attempt at compensatory hypertrophy, restricted by a new formation of fibrous tissue which traversed the organ, and which had produced marked pressure atrophy of the liver cells.

In four other cases of poisoning by tetrachlorethane which I had an opportunity of examining the course of the illness was more rapid. These livers were even more reduced in size than in the first case, but they showed only the destructive effects of the poison on microscopical examination.

In a case of fatal poisoning by dinitrobenzene the liver showed a coarse cirrhosis not unlike the common variety of multilobular cirrhosis, but differing from it in the irregular distribution of the fibrous tissue. There was much pressure atrophy of the liver cells in this case.

I have examined seven fatal cases of poisoning by T.N.T., in all of which the illness was of short duration. The liver was reduced in size in all the cases, very markedly so in some of them, but on microscopical examination the predominant change was a fatty degeneration and necrosis of the liver cells; only in two of the cases was fibrosis commencing in the organ. Other observers who have investigated cases which ran a more prolonged course have described extensive fibrosis in the liver.

It is probable that many persons who had a severe attack of T.N.T. poisoning and who recovered have received permanent damage to the liver from the production of scar tissue, interfering with processes of compensatory hypertrophy and bringing about further atrophy of the liver tissue by its contraction.

We shall probably see in the *post-mortem* room for some time to come irregularly scarred livers in cases where there is a history of a previous attack of T.N.T. poisoning, and cases may even occur in which a more widely distributed fibrosis of the organ has brought about a progressive atrophy by its contraction—a condition comparable to atrophic cirrhosis, and in which death is the result of an attack of T.N.T. poisoning which occurred a long time previously.

Finally, I have two plate specimens of another toxic process in the liver, namely, salvarsan poisoning. For the loan of these specimens I am indebted to Dr. T. H. G. Shore, Curator of the Museum at St. Bartholomew's Hospital, who obtained them at a base hospital in France.

The patients from whom these specimens were obtained had received very concentrated treatment, one having had eight doses of neo-salvarsan within three weeks. They survived the

treatment for several weeks, and at autopsy the livers were much reduced in size and weighed only 25 oz. and 28 oz. respectively.

In these preparations liver tissue is present only in the dark green areas which are coloured by retained bile pigment. The areas of liver tissue are surrounded by fibrous tissue, and the rest of the preparations, which show variations in colour from light green to a greenish-brown and a fawn colour, consists of fibrous tissue which encloses and here and there replaces the blood capillaries of the lobules from which all liver cells have disappeared. Atrophic changes are present in the remains of the liver tissue as a result of the contraction taking place in the surrounding scar tissue.

In these remarks attention is directed to the processes of atrophy occurring in the liver as a secondary process in cases where the primary disease was an inflammation or a degeneration.

I have referred only to one group of atrophies of the liver in which the immediate causative agent is the pressure of contracting scar tissue. I have not dealt exhaustively even with this group, but the examples which I have given show how frequently atrophy is encountered in the liver, and how the function of the organ may be impaired, with serious and in some cases fatal results under such conditions.

I am indebted to the authorities of St. Bartholomew's Hospital for the loan of the museum specimens which have illustrated my remarks.

M. J. Stewart, M.B., Ch.B.Glasg., M.R.C.P.Lond.,
Professor of Pathology and Bacteriology, University of Leeds.

For the purposes of this discussion I have reinvestigated all the cases of atrophy of the liver which I have seen *post mortem* in Leeds during the past ten years. They number 16 in all—namely, 4 idiopathic atrophies, 11 due to trinitrotoluene poisoning, and one occurring in a case of syphilis which had been treated with galyl. The four idiopathic cases were met with in the course of 4,770 consecutive *post-mortem* examinations—an incidence rate of barely 0.1 per cent. I have also traced the after-history of 17 cases of toxic jaundice due to trinitrotoluene which were treated in the wards of the General Infirmary at Leeds in the years 1916 and 1917.

Etiology.

Of the four idiopathic cases, a possible etiological factor was definitely present in one only—a woman of 53, who had gall stones and acute cholecystitis, for which she was operated on three days before death. Her symptoms—abdominal pain, vomiting, and jaundice—had commenced four weeks previously. The other three cases were in boys aged 6, 8, and 13 years respectively. One was an acute case, with jaundice of only two weeks' duration, while the others were of subacute or chronic type. In one of them the severest jaundice had been thirty weeks previously, and at the time of his death, which was due to an intercurrent pneumonia, only a slightly icteric tint of skin remained. In all four the previous state of health had apparently been good, and in none was there any evidence of syphilis.

In the eleven cases occurring among workers in trinitrotoluene the etiological connexion with that substance seems clear, although the actual mechanism of production may be in doubt. Benjamin Moore[1] considers that the liver changes are probably always secondary to changes in the blood (production of methaemoglobin, increased haemoglobin metabolism, greatly increased demand for functional activity of liver and bone marrow), but does not deny the possibility of a direct hepatotoxic action. In my own series of fatal cases profound red-cell changes were certainly present in several, but in three there was a normal red cell and haemoglobin picture up to the time of death. I am therefore disposed to lay considerable stress on direct toxic action on the liver cell. The chief difficulty is to explain why only a very limited number of the workers employed were attacked. This may be partly due to the fact, established by Moore and Wyon (Moore, op. cit.), that some people, probably a considerable proportion, absorb trinitrotoluene readily through the skin, others only very slightly, but it is insufficient to explain the discrepancy altogether. Two alternatives remain: either there is an additional unknown factor or factors, or we must assume that in certain people there is a natural intolerance or susceptibility to trinitrotoluene on the part of the liver cell. In respect of the former I was unable to arrive at any conclusion, although pregnancy and syphilis could apparently be ruled out.

The remaining case in this series, that which followed galyl treatment of syphilis, has already been discussed elsewhere (Stewart, Vining, and Bibby[2]), and the opinion then expressed was that the liver atrophy was due to the drug rather than to the syphilis. The suggestion was also made that considering the close resemblance to trinitrotoluene atrophy the benzene fraction and not the arsenic was possibly responsible. Foulerton[3] had previously suggested that "the toxic effects of certain organic arsenic compounds may be influenced materially by the benzene constituent."

Morbid Anatomy.

Further study of the material at my disposal, as well as of the literature of the subject, has only served to impress me the more with the essential similarity of the lesion in cases of idiopathic atrophy, and in those due to poisoning by trinitrotoluene. In both there are the red areas of complete, or almost complete, destruction of liver cells, and the yellow areas of persistent liver tissue, which, in subacute and chronic cases, often show well marked regenerative hyperplasia. The colour of the red areas is due in part to intense vascular engorgement, in part to free haemorrhage into the interstices of the persisting supporting framework; that of the yellow areas partly to fatty changes, much more to biliary stasis and staining. The differentiation of the red and yellow areas is best seen in subacute and chronic cases.

It is exceptional to find cases of trinitrotoluene atrophy running the rapid clinical course which is familiar in idiopathic acute yellow atrophy; they are more often of subacute type, and consequently show *post mortem* the well-marked differentiation of the red and yellow areas referred to above. In my trinitrotoluene series there was but one really acute case, that of a young woman of 21, who only lived a week from the first onset of symptoms. The liver weighed 13½ oz. and was mainly composed of red tissue.

In general the more acute the case the smaller is the liver found to be on *post-mortem* examination.

Table I.—*Cases of Trinitrotoluene Atrophy (Adult Female Workers only).*

Duration of Jaundice. Weeks.	Weight of Liver. oz.
1	13½
3	20
3	24
7	24
7	29
8	32

This is probably merely an index of the fact that in the most acute and rapidly fatal cases very large areas of the liver undergo cytolytic disintegration ("red" atrophy), while in those which survive for a few weeks the size of the liver is doubtless increased by regenerative hyperplasia of the yellow areas.

I have noticed that as a rule very little free fat is to be seen in the red areas, where the liver cells appear to undergo a rapid autolysis. If fatty changes take place at all it must be at a very early stage, and it is probably at most quite a minor phenomenon. In the acute trinitrotoluene case above mentioned, for example, it is difficult to conceive of the small red liver of 13½ oz. weight having within a week gone through a preliminary fatty stage. Fatty changes develop, however, in those liver cells which have been less severely damaged by the original intoxication, and are best seen in some of the less acute cases. Even here the fatty changes are by no means extreme. This is contrary to what is seen in, for example, the extreme fatty liver of phosphorus poisoning, where fatty changes of degenerative type are strikingly present throughout the whole organ from a very early stage, and where widespread cellular disintegration develops subsequently. These variations are associated with notable differences in size of the organ—namely, great reduction in cases of atrophy, definite enlargement in most cases of phosphorus poisoning. Wells[4] has compared the fat content of the liver as given by different observers (1) in the healthy organ, (2) in acute atrophy, and (3) in phosphorus poisoning, with the result shown in Table II.

Table II.—*Fat Content of Liver in Various Conditions.*

	Percentage of Fat.
Normal liver	3 to 5
Acute atrophy	2 to 8.7
Phosphorus poisoning	29.8

In cases which survive the acute stage—that is, in which the toxic action on the liver has been less severe, so that considerable areas escape complete autolysis—a further series of changes take place. The red areas become the seat of an active fibroblastic proliferation, with much plasma cell and lymphocyte infiltration, so that they become quite pale from devascularization and absorption of effused blood. At the same time there is usually great proliferation of bile canaliculi, spreading outwards from the portal tracts. In one instance there is, I think, definite evidence that this process has gone on to the formation of actual functioning hepatic cells. This is the chronic case in a boy, already referred to, where the initial lesion occurred thirty weeks before death.

Subsequent History in Cases which Recover.

In cases which ultimately recover, the regenerative changes presumably result in the formation of sufficient active liver tissue to restore, more or less, the functional integrity of the organ.

I have followed up seventeen patients who were in the Leeds General Infirmary in the years 1916 and 1917 suffering from toxic jaundice due to trinitrotoluene. Eight of these were very deeply jaundiced, and three of them were so seriously ill, with well-marked cerebral symptoms, haemorrhages or other grave manifestations, that for a time their recovery was despaired of. All are alive and in reasonably good health at the present time; at least all are able to carry on their daily work without difficulty. Practically all of them suffer from a certain amount of epigastric pain and a few have occasional bilious attacks. None have been jaundiced at any time since they recovered from their original illness.

That the more seriously ill of these patients had a similar hepatic lesion to that found in patients who died, there can, I think, be no reasonable doubt. I would go farther and suggest that in all cases of definite toxic jaundice due to trinitrotoluene the liver was the seat of comparable atrophic changes, though possibly, as regards the more advanced destructive lesion, of quite limited extent. In the present series the case of atrophy following galyl treatment of syphilis may be cited in support of this hypothesis. There the attack of jaundice, following a course of galyl, was quite transient, but ten weeks later, on the death of the patient under an anaesthetic, a typical red atrophy of limited extent was found. The rest of the liver showed only fatty changes and some round-cell infiltration of the portal tracts. This patient was almost certainly making a good recovery from the hepatic atrophy when the administration of a general anaesthetic led to a fatal issue. If this view is correct, it follows that quite mild grades of acute yellow atrophy occur in which clinical symptoms are slight and recovery the rule. Possibly even certain cases of so-called simple catarrhal jaundice are really of this nature.

Summary.

1. Atrophy of the liver is a toxic lesion in which the whole organ is more or less seriously injured. Certain portions are damaged so severely that the hepatic parenchyma undergoes more or less complete cytolytic disintegration while other parts survive, and the stage at which death takes place depends on the amount of tissue so surviving.

2. Fatty changes are not a prominent feature in the areas which undergo necrosis, but are often present in the areas which survive. They are best seen in the so-called subacute cases—that is, after an interval of a few weeks or months.

3. In cases which recover, whether partially or completely, the persisting parenchymatous areas undergo regenerative hyperplasia, while often showing a certain amount of intervening portal cirrhosis and round-cell infiltration. The red areas of cytolysis and haemorrhage, on the other hand, become the seat of marked fibroblastic proliferation and round-cell infiltration, so that in course of time they become pale, firm, and sclerotic. They often show well marked proliferation of bile canaliculi along the old portal tracts, and in chronic cases true functioning hepatic cells may be formed therefrom.

4. The acute, subacute, and chronic atrophies of the liver so-called constitute a single morbid entity, and the different appearances seen *post mortem* are dependent on the stage of the disease at which death takes place, this in turn depending on the severity of the initial lesion.

5. The lesions in the idiopathic atrophies and in those due to poisoning by trinitrotoluene and arsenobenzene are apparently identical. The lesions in phosphorus poisoning are of a different order, and are characterized primarily by extreme fatty degeneration, which may subsequently go on to widespread cytolysis.

REFERENCES.

[1] Benjamin Moore: Medical Research Committee's Special Report Series, No. 11, p. 40. [2] M. J. Stewart, C. W. Vining, and J. P. Bibby: Proceedings of the Pathological Society of Great Britain and Ireland, *Journ. Path. and Bact.*, 1919, xxiii, 1. [3] A. G. R. Foulerton: *Journ. R.A.M.C.*, 1918, xxx, 535. [4] H. G. Wells: *Chemical Pathology*, third edition, 1918, p. 545.

J. W. McNee, D.S.O., M.D.Glas.

What I have to say deals with the subject under discussion in an indirect way, but brings out some points of interest in the light of previous contributions to this discussion. For a considerable time I have been interested in the method of production of one of the chief signs of acute liver atrophy, namely, jaundice. This work has been chiefly carried out by experimental methods. During the war I was also able to examine the liver in human cases of a special form of toxic jaundice, due to spirochaetal infection—namely, spirochaetal jaundice, or Weil's disease. In this disease the jaundice is not due to any biliary obstruction, nor is it of haemolytic type. It is due to toxic damage to the liver cells themselves, so that their function is deranged. The histological changes found vary greatly, and the severity of the jaundice seems to bear no direct relation to the intensity of the changes found in the liver lobules. In some cases, where jaundice is very striking in degree, hardly any gross changes are to be found in the liver lobule. In other cases there is great dissociation of the liver cells, which come to lie in all directions, and have no longer the appearance of columns. Many of the cells under such circumstances are necrotic.

In other cases again, following the necrosis, great proliferative changes occur in the liver cells which survive, and mitotic figures are very numerous in the sections.

It is important to note, in comparing these changes with those of the various types of liver atrophy described, that no fat can be found in any part of the lobule, even in cases where necrosis is extreme.

Before concluding I wish to emphasize the fact that we know really very little about some of the normal functional activities of the hepatic cells. Even the finer anatomical structure of the liver lobule is far from clear. Some important work on disordered function of the liver, which may have a bearing on various hepatic diseases, has been done recently by French workers (Brulé, etc.) on so-called "dissociated jaundice." It has been found, for instance, that in some cases bile pigments may circulate in the blood and produce jaundice, while the bile acids and salts continue to be excreted in the normal way. On the other hand, the bile acids and salts may enter the blood stream without the bile pigments, so that the colour changes of jaundice are absent.

Colonel William Hunter, C.B. (London), said that he had not prepared a paper, but he had had experience of acute yellow atrophy in epidemic jaundice among troops. After his return to England he had opportunities of investigating the condition as it occurred in salvarsan and delayed chloroform poisoning. He would like to say a few words on the subject of fatty degeneration in acute yellow atrophy. He did not agree with Dr. Foulerton that the fatty changes were due to infiltration. In his opinion the fat was a product of cell degeneration, and due to the unmasking of fat which was previously present in a soluble form. What had struck him most forcibly in his experiments on animals and in *post-mortem* examinations performed on cases of delayed chloroform and T.N.T. poisoning was the sudden simultaneous action of the poison on the parenchyma of the heart, liver, and kidneys, and indeed of every cell in the body. These simultaneous fatty changes could not be explained by any theory of infiltration. The continuation of life was dependent on the proper functioning of the brain, heart, and liver. The lesion, if severe enough, would prevent the liver cells from carrying out their function. They would then undergo digestion by their own ferments, and this would account for their universal destruction. Portal blood would pass unchanged into the general circulation, carrying with it toxins

which should have been metabolized by the liver, and this, along with the products of liver degeneration, caused the toxic symptoms of the disease.

Openers' Replies.

Dr. Rutherford said that Dr. Spilsbury had referred to atrophy from contraction of fibrous tissue in atrophic cirrhosis with failure of reaction. In the cases of multiple nodular hyperplasia, on the other hand, reaction was prominent both in parenchyma and interstitium. The intense fatty infiltration in the kidney in Dr. Foulerton's animal experiments appeared striking: as in idiopathic cases of acute liver atrophy, the change usually met with was an intense degree of cloudy swelling, visible fat as demonstrable by the ordinary fat stains not being greatly in evidence. Professor Stewart's cases illustrated well the morphological continuity of the process, and also the very varying etiology of a condition which appeared from the morbid anatomy point of view to be a single morbid entity. Possibly light might be thrown on the etiology of "idiopathic" cases, especially those more prolonged and with recurrent attacks of jaundice, by a study of the intestinal flora other than the well recognized pathogenic bowel organisms.

Recurring attacks on the liver of subacute intensity, such as occurred in some of the multiple nodular hyperplasic cases, might be related to a bacterial cause varying in pathogenic capability under the varying conditions that obtained in the bowel. As regards distribution and the sparing of parts in relation to the capsule, the question arose, in those showing a surviving zone immediately subjacent to the peritoneal investment, as to whether this were related to the peritoneal secretion. It might also indicate infection proceeding from the hilum outwards, and in some of the chronic cases the arrangement of hyperplasic nodules in clusters in relation to the larger portal tracts supported the latter hypothesis.

Dr. James Miller, in replying, expressed regret that there had not been more criticism regarding some controversial points which had been purposely raised. The question of nomenclature was an important one. Were the more chronic cases to be known as cirrhosis, or was the term multiple nodular hyperplasia to be used? He was inclined to think that cirrhosis did not properly suggest the real nature of the pathological process. While the term multiple nodular hyperplasia was probably not the best, it was in actual use and did describe the appearance and the predominant underlying change. Another point upon which he would have wished to hear the views of those present was the mode by which the liver regenerated itself. Did the large number of bile-duct-like structures indicate regenerative change? If so, was it effective? Did the bile ducts produce liver tissue or did they merely link up with liver columns developing from parenchymatous cells which survived the general destructive process? Speaking for himself, he was quite clear that this did represent an attempt to form liver substance, but there could be little doubt that most of the functioning liver tissue arose from the liver cells themselves. In the cases which manifested the earlier regenerative changes all gradations between liver cells and bile ducts could be made out, and it was almost impossible to decide the relationship which they bore to one another.

DEMONSTRATION
ON
THE LIBERATION OF ENERGY DURING THE INTERACTION OF HYPOCHLOROUS ACID AND LIVING AND DEAD ORGANIC MATTER.

BY

Sir G. Sims Woodhead, K.B.E., M.D., V.D.,
F.R.S.Edin.,
Professor of Pathology, University of Cambridge.

During a prolonged investigation bearing on the sterilization of water by means of hypochlorite solutions I was early struck by the tremendous activity—selective activity—of the hypochlorates as bactericidal agents. Of the suggested explanations of this activity none appeared to me to be satisfactory. I arranged, therefore, to carry out a series of experiments, devised with the object of determining the mode of action of this group of powerful bactericidal agents. The outcome of these I hope to publish shortly.

Liveing and Dewar, in their records of spectroscopic investigations on the flame of the electric arc, draw attention to the fact that though the mean (measurable) temperature of the flame is comparatively low there are, as determined by spectroscopic indications, individual molecules in the flame in which the temperature is probably very much higher than the mean temperature recorded.[1] May we not have some similar "energy evolution" and distribution or localization in mixtures and solutions in which we are unable to record high temperatures?

Energy in the form of heat is set free when bleaching powder in solution is mixed with certain organic nitrogenous substances and micro-organisms in concentrated solution and emulsions. Can any relation between these be demonstrated and is the process comparable in all cases?

Demonstration.

The bleaching powder solution was mixed in turn with, amongst many other substances—

(*a*) Urea solution,
(*b*) A protein—egg albumen in solution,
(*c*) Yeast in emulsion.

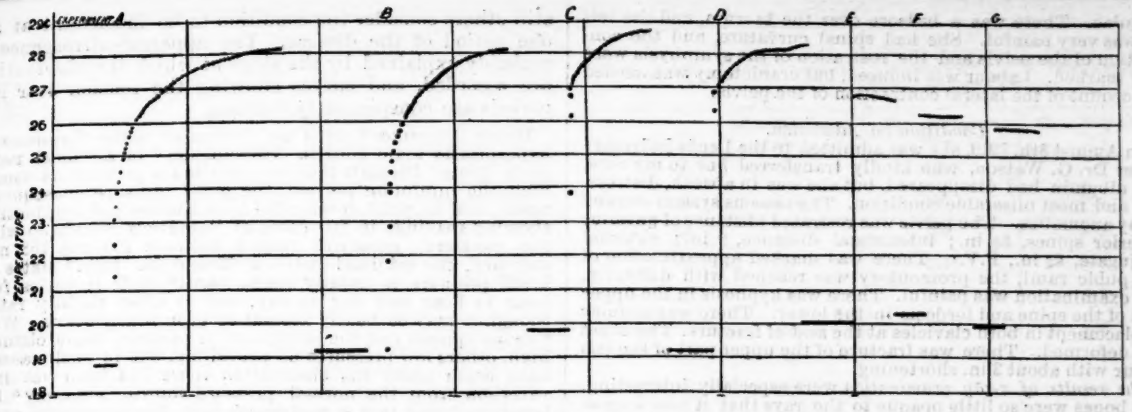
The mixture was in each case made in a Thermos flask, kept in constant motion by a small glass agitator electrically driven. Into this flask was fitted an "electrical resistance" thermometer,[2] by means of which the heat evolved was determined, approximately at any rate, and recorded on a Darwin's thread recorder (see Chart).[3] It was not possible, of course, by these means to measure the whole of the energy evolved—some of it being used up in doing work—but a fairly accurate record of the amount of heat set free and remaining after energy had been used up in doing work was obtained by noting the rate and extent of the rise of temperature (mean).

If the analogy with the mean and localized temperature in spectroscopic work holds good, it may be accepted that the mean temperature attained when the hypochlorite acts on urea in a concentrated solution will be higher than if the urea be in dilute solution, the volume of water to be heated being less. Moreover, we should expect the liberation of energy to be almost instantaneous, the energy being liberated at every point where the urea is brought into contact with the hypochlorite in solution; this should be immediate; such is found to be the case (see E, F, and G, chart and table).

In this chart are given the curves from which the accompanying table has been drawn up. Here the horizontal line under each curve represents the temperature at which the experiment starts. Each dot of the upper curve represents a point at which a record of the temperature attained is marked on the chart. Where the dots are wide apart, each being separated from the other by a space representing a period of one minute, the rise of temperature is rapid. As the intervals become less, a slower rise is indicated. Finally, as seen in many of the curves, we have a continuous line indicating a very slow rise or commencing fall owing to some slight loss of heat by radiation. Some allowance being made for "lag" of the thermometer it is obvious that the development of heat and its distribution throughout the 300 c.cm. of water must go on very rapidly. In the experiments with yeasts, where the protein can be attacked but slowly, the rise of temperature is considerably slower than in the egg albumen experiments in which the protein is more accessible, and slower still than in the urea experiments in which the nitrogen can be attacked instantaneously. In experiment A there is a rise of mean temperature of nearly 3° in the first minute, 1° in the second, 0.5° in the third; after that a very gradual curve up to 28.1° is seen. In experiment C. there is a rise of 4.2° during the first minute, 2.4° in the second minute, 0.5° in the third minute, then the curve corresponds very closely to the latter portion of curves A and B. Curve D corresponds very closely to curve C, except that there is a slight fall in the middle of the terminal horizontal portion of the line, from which it may be inferred that in spite of the movement of the stirrer some gas has accumulated around the thermometer. In curves E, F and G the energy is liberated with almost explosive rapidity within the first minute, as indicated by the continuous horizontal line formed one minute after the first recorded temperature.

When white of egg is acted upon the reaction is slower, as the breaking down of the protein must first take place, but the energy ultimately set free and transferred to the water is greater in amount (see C and D, chart and table). Similarly, when yeast is acted upon by the hypochlorite (see A and B, chart and table) we have a larger amount of energy set free, but the process goes on still more slowly than in either of the other sets of experiments.* In all

* In this work I have been greatly indebted to my assistant, Mr. W. A. Mitchell, who, in addition to giving me valuable help generally, carried out for me a large number of experiments in Cambridge whilst I was serving in Ireland and elsewhere.



Temperature reactions obtained on the addition of 1 per cent. hypochlorite (bleaching powder) to yeast, white of egg, and urea. The mixture was in each case made up to 300 c.cm.

Experiment.	A.	B.	C.	D.	E.	F.	G.
Organic matter used in experiment	Yeast 5 per cent.	Yeast 5 per cent.	White of one egg	White of two eggs	Urea 6 per cent.	Urea 1 per cent.	Urea 1 per cent.
Maximum temperature in (°C.) attained	28.1	28.1	28.7	28.4	26 8	26.2	25.8
Rise of temperature (°C.) during experiment ...	9.5	9.0	9.0	9.0	6.8	6.0	5.8
Number of minutes in which maximum temperature was reached	46	46	26	26	2	2	2
Calories per gram available Cl	950	900	900	900	680	600	580

three sets of experiments, but especially in the urea experiments, some of the energy is used up in doing work of recombination, but a large proportion manifests itself in the form of heat capable of raising the temperature of the considerable volume of water in which the reaction takes place. This, however, provides no measure of the temperature attained at certain points, especially where ferment-producing organisms, such as yeasts, are present. It gives a general indication as to the energy set free, but little direct information as to the amount or concentration of energy liberated and acting in the fields in which the most active processes are going on—that is, with yeasts, *Bacillus coli communis*, etc.—in the organisms or at their surface in the presence of the enzymes formed; or, again, in connexion with certain protein or nitrogen-containing molecules.

As we now know, the amount of hypochlorite required for the sterilization of water depends directly upon the amount of oxidizable organic matter, dead and living, present[4]—that is, upon the amount of the sterilizing agent that ultimately can come into direct contact with, and react upon, the living organisms. Only when, but as soon as, a sufficient amount of hypochlorite can act upon the intestinal organisms (*Bacillus coli communis*, typhoid bacillus, cholera bacillus, etc.) are these organisms killed.

The micro-organisms, when present in water in small numbers, are scattered relatively wide apart, and it is obvious that the energy evolved from the small amount of hypochlorite added is not sufficient to raise the temperature appreciably of the large volume of water in which it acts, though developed locally in contact with the above non-spore-bearing organisms it is sufficient to ensure their death almost instantaneously.[5]

Through what phase or transformations the energy may have gone before it manifested its presence in the form of heat I am not yet in a position to demonstrate, but it may be pointed out that if in a darkened room a solution of bleaching powder be run into a flask containing urine a distinct phosphorescence may be seen, if care be taken to rest the retina for twenty minutes or half an hour in the dark room before attempting to make the observation. In this, a reaction we anticipated from our other observations and from those made on pyrogallol by E. Newton Harvey,[6] we have evidence of a rapid transformation of ultra-violet light wave energy through energy of visible wave lengths to the non-visible heat rays, the hypochlorite acting on the organic nitrogenous matter contained in the urine and setting free energy of different types or energy passing through different phases.

Into the question as to which of these phases of energy we owe the sterilization in any specific case I cannot enter at present, but it appears probable that in each instance the action is of greater intensity because so localized, and that the energy of shortest wave length of those examined is the most active bactericidal agent. Reading the accounts of Professor J. M. Beattie and Dr. Lewis's experiments on the sterilization of milk by means of the passage through it of an electric current,[7] I am led to the conclusion that here, as in my own experiments, it is not general or mean temperature that decides sterilization, but the energy set free and acting *in situ* on the micro-organisms contained in the milk.

REFERENCES.

[1] *Proc. Roy. Soc.*, vol. xxxiv (1882), p. 129. [2] *Lancet*, 1915, i, p. 329. [3] Ibid., p. 287. [4] *Journ. Roy. Micros. Society*, 1915, p. 215. [5] Ibid., p. 217. [6] *Journ. Biol. Chem.*, Baltimore, 1917, vol. xxxi, p. 335. [7] *Journ. Path. and Bacteriol.*, 1913-14, vol. xviii, p. 122 (Proc. Path. Soc. Great Britain and Ireland); Report to Health Committee of the City of Liverpool, June, 1913; Ibid., April 16th, 1914; Report of Medical Research Council, Special Report Series, No. 49, 1920.

A CASE OF OSTEOMALACIA TREATED BY OÖPHORECTOMY.

BY

J. B. HELLIER, M.D.LOND.,

HONORARY CONSULTING OBSTETRIC PHYSICIAN TO THE LEEDS INFIRMARY, THE LEEDS HOSPITAL FOR WOMEN, AND THE LEEDS MATERNITY HOSPITAL; EMERITUS PROFESSOR OF OBSTETRICS, UNIVERSITY OF LEEDS.

THE curative effect of the removal of the ovaries in osteomalacia was discovered by Fehling by observations made on patients who had undergone Porro-hysterectomy for contracted pelvis, but the opportunity of treating this disease is so rare in this country that it is of interest to record individual experiences.

Mrs. A. S., aged 38, has always lived in the West Riding of Yorkshire and has always had good and sufficient food and average healthy surroundings. Her sister, who is a well-developed florid woman, says that the patient used to be in as good condition as herself. A. S. weighed 10 st. 4 lb. and her height was 5 ft. 5 in. She worked as a weaver from 14 to 31, and had no serious illness. She married at 31 and has had four pregnancies. The second child was born five and a half years ago without any dystocia; eighteen months ago she had an abortion in the second month of gestation. After the birth of her second child she did not regain her strength properly. She lost weight and had pains all over her, which she thought were rheumatic, and she was able to walk only with difficulty. After a time she got much better and at Christmas, 1916, could walk well. Then she fell off again. About Easter, 1919, one collar bone broke spontaneously and the other at Whitsuntide. At this time also she fell downstairs, and has never walked properly since.

She became pregnant about the end of 1918, and in February, 1919, her left leg began to swell. She had to take to her bed in June, her back being swollen and painful. She seems to have developed albuminuria and anasarca. In July she was admitted to the Maternity Hospital under the care of Dr. Rhoda Adamson. At that time the urine was nearly solid on boiling. There was a mitral systolic bruit and anasarca up to the

scapulae. There was a bedsore over the sacrum, and the left leg was very painful. She had spinal curvature, and the contraction of the pelvis and the rostration of the symphysis were very marked. Labour was induced, but craniotomy was needed on account of the lateral contraction of the pelvis.

Condition on Admission.

On August 8th, 1919, she was admitted to the Leeds Infirmary under Dr. G. Watson, who kindly transferred her to my care. The albumin had disappeared, but she was in a weak, distressing, and most miserable condition. The osseous system showed many anomalies. The pelvis was rostrated (distance of anterior superior spines, 8¼ in.; intercristal distance, 9 in.; external conjugate, 6¾ in., P.V.). There was marked approximation of the pubic rami, the promontory was reached with difficulty, and examination was painful. There was kyphosis in the upper part of the spine and lordosis in the lower. There was angular displacement in both clavicles at the seat of fracture. The chest was deformed. There was fracture of the upper part of the left femur with about 2 in. shortening.

The results of x-ray examination were especially interesting. The bones were so little opaque to the rays that it was impossible to obtain a good skiagram. The shape of the osteomalacic pelvis was obvious. There was a well marked fracture of the upper end of the left femur with upward displacement of the lower fragment. Several fractures could be made out in the pelvic bones and another in the right tibia.

Operation.

On September 15th, 1919, I removed the ovaries. They were normal in appearance, and the uterus had undergone normal involution. On October 15th she was very much better; she was bright and cheerful; all pain had gone, and she was able to rise from bed and hobble a short distance with a stick. The urine was normal.

Condition Twelve Months later.

The patient attended at the infirmary on September 15th, 1920. She seemed very much better in all respects. She was bright and cheerful, and had gained fifteen pounds since operation. She was free from pain, and able to walk some distance without crutches, although the shortening of the leg makes her lame. The skiagram shows that the bones are certainly more opaque than at the last examination, and there seems to be some new bone formation at the iliac crest.

I am indebted to Miss Wheatley for assistance in the clinical records of this case.

It is said that 80 per cent. of osteomalacia cases recover under this treatment. Left to themselves the women, who are as a rule very prolific, grow worse with each succeeding pregnancy, and ultimately die from exhaustion, bedsores, and so on, or from phthisis or other intercurrent disease. It is said that occasionally the disease affects males, but I have never heard of such a case in this country.

A CONTRIBUTION ON BLOOD PRESSURE IN GRAVES'S DISEASE.

BY

J. STRICKLAND GOODALL, M.B., M.R.C.P.,

M.S.A.LOND., F.R.C.S., F.R.S.EDIN.,

SENIOR OUT-PATIENT PHYSICIAN, NATIONAL HEART HOSPITAL, LONDON; LATE LECTURER ON PHYSIOLOGY, AND SUBDEAN, MIDDLESEX HOSPITAL;

AND

LAMBERT ROGERS, M.R.C.S., L.R.C.P.,

LATE R.N.V.R.

OWING largely to the results of such workers as Berry in England, Dunhill in Australia, and the Mayos in America, the surgical treatment of Graves's disease is coming more and more into prominence.

The question of the operative risk in Graves's disease is one that requires most careful consideration, as operations on exophthalmic goitres are usually regarded as particularly dangerous (though with increasing experience actual figures show that the mortality is little, if at all, above that of abdominal operations). Every case must be judged on its merits, and, in addition to such general considerations as the type, stage, and the severity of the disease, it is important to gauge accurately the condition of the heart[1] and the blood pressure. The cardio-vascular condition very largely assists one in determining (*a*) whether an operation can be undertaken without undue risk, (*b*) the nature of the operation—for example, whether preliminary ligation should be performed or immediate excision of part of the gland be undertaken.

Referring to the literature, one is impressed with the great diversity in the records of different observers, some regarding a high tension as typical, others a low, while still others consider the condition to be inconstant at any one period of the disease. The apparent divergence is probably explained by the stage at which the observations are recorded, and curves showing the tension over long periods are conspicuously wanting.

Henry Plummer[2] finds an increased pulse pressure in hyperplastic toxic goitres. Hirschfelder[3] in his most recent work quotes Pressaft that the maximum pressure is usually high, the minimum normal, the pulse pressure consequently raised, and he publishes a table from Krause and Friedenthal,[4] showing readings in ten cases of Basedow's disease in which the maximal pressures ranged between 106 and 158 mm. mercury, the minimal between 62 and 66. Bain[5] states the blood pressure is usually high. Scott[6] finds it varies from hour to hour and day to day, and is often slightly raised, though it may be nearly normal or even much below. W. H. Cowing[7] points out the difference in opinion, some claiming high, others low pressures as prevailing, but in such cases as have come under his observation there has been but little variation from the normal pressure shown. Janeway[8] has, however, found that a moderately high blood pressure exists, but is inclined to think the extreme nervousness of exophthalmic goitre cases may account for it. Percival Nicholson[9] states that the pressure is variable, but as the disease is often accompanied by a hypertrophied heart, the systolic pressure is often raised; he quotes as typical a systolic from 140–160 mm. mercury with a diastolic from 90–110 mm. and a pulse rate of 120 or more.

Spiethoff[10] is very emphatic in saying no constant changes in blood pressure show in lighter forms of Graves's disease, but in severe cases both high and low pressures occur. Donath also records varying pressures. Eve[11] has recorded a case, terminating in acute thyroid atrophy, in a woman aged 40, with a very variable blood pressure, rising from about normal to 240 mm. mercury, when its measurement became painful and caused petechial escape of blood from the tissues of the forearm. Professor W. T. Halstead[12] says that those cases associated with "thymus persistans" show vagotonic symptoms, among which low blood pressure may be mentioned. Herbert French[13] states that an abnormally low blood pressure of moderate degree is apt to accompany Graves's disease. Hensen, Gross, Bing, Feldern, and Jackson consider the systolic pressure high, and are supported by Taussig,[14] who finds an increased pulse pressure, and draws an analogy between the cardio-vascular phenomena in Graves's disease and those of aortic regurgitation. He finds the systolic pressure greater in the leg than in the arm in both diseases.

Turning to the experimental side of the question, we find certain observers recording a fall in tension produced by injecting thyroid.

Hale-White[15] finds that the blood pressure falls when a decoction of the gland is injected, and states that the fall is vasomotor, for the heart is not affected. G. Oliver[16] has shown that thyroid juice or other preparations of thyroid "seem to possess a special tendency to increase the calibre of the radial artery" in the human subject. Hutchinson,[17] on the other hand, found no depression from injecting colloid alone, but a decided fall upon injecting extractives; upon separating these latter into the organic and mineral constituents he found the fall in the main produced by the former. Further, it has recently been shown that the therapeutic effects of the iodides in reducing arterial tension are probably the result of an increased output of thyroid substance produced by an increase in autolysis in the gland, consequent upon removal of the inhibitory effect of unsaturated fatty acids by their saturation with iodides.[18] In this connexion it is interesting to note a case of hyperthyroidism described by Rendle Short,[19] and produced by iodoform poisoning following application of this substance to an absorbing surface.

The foregoing all refer to normal thyroid secretion. What is the condition in exophthalmic goitre, however?

R. McCarrison,[20] believing that changes in the thyroid secretion are both quantitative and qualitative, considers that a substance is produced in the gland in Graves's disease which has a powerful action in reducing blood pressure.

Schoborn[21] showed that the essential difference between the action of extracts of simple and exophthalmic goitres was that extracts of the latter produced a more marked fall in blood pressure. These results were confirmed by Gley,[22] and important extensions were made by Blackford and Sandford.[23] Experimenting on dogs and using forty-six exophthalmic goitres, these authorities found that from quarter to half a minute after injecting saline extractives of the goitres a sudden fall in blood pressure, averaging about 60 mm. mercury, occurred; that this drop was greater than that caused by any other extract of organs; that whereas recovery occurred usually two or three minutes afterwards, this was delayed for fifteen in some cases, and that a tolerance against a second injection was established in each case. They found that simple goitres—for example, adenomas—often gave no demonstrable effect on the tension, and stated that normal thyroid juice, in much larger doses than that from the exophthalmic or simple goitres, gave only a moderate depression, not more than could be obtained by the injection of extracts of most cellular organs in large doses, but believed the supposition "that the depressor action of extracts of exophthalmic goitre to be a matter of dosage and common to all tissues" was not justifiable. They have further demonstrated that atropine did not inhibit the action of the depressor substance from

the exophthalmic glands, and that the extract did not behave physiologically like cholin, a well-known blood pressure reducing substance, nor did it increase vagus irritability, the depression being caused chiefly through vaso-dilatation, aided by some diminution of the output. Blackford and Sandford have further found a powerful depressor substance in the blood serum of patients with Graves's disease, and, finding a "crossed tolerance" existing between extracts of hyperplastic goitres and this substance, assumed it to be identical with the depressor substance from the gland.

It would appear, therefore, that the thyroid activity in Graves's disease results in production of a depressor body.

From the observations of one of us (J. S. G.), in some cases extending over twenty years, and including more particularly those cases operated on by Berry and Joll, it would appear that the blood pressure during the greater part of the disease was low. The following table of ten cases occurring in women between the ages of 23 and 48 serves to illustrate this. In each case the blood pressure is below the physiological value we should expect, this latter figure being obtained from the formula (Age + 100) −5 per cent. It must be insisted that these cases are not in any way selected, but taken at random from records including cases of all types of severity, from the "formes frustes" to the most toxic types.

Patient.	Age.	Blood Pressure.	Blood Pressure Expected in Health (approx.).*	Difference.
		Mm. Mercury.	Mm. Mercury.	Mm. Mercury.
1	23	110	117	− 7
2	27	90	121	−31
3	27	80	121	−41
4	30	94	124	−30
5	31	94	124	−30
6	34	120	127	− 7
7	35	100	128	−28
8	36	125	129	− 4
9	37	80	130	−50
10	48	125	141	−16

* Obtained by formula (Age + 100) − 5 per cent.

In these cases the fall in blood pressure will be seen to vary between 4 and 50 mm. The disease was well established, and the histories showed that the onset had been gradual; we believe that in each case the pressures shown were taken in the second stage of what we consider to be a typical triphasic variation occurring in the course of Graves's disease. It might be stated that in Case 2 the onset was gradual, but accelerated by the birth of a child. In Case 3 there was a family history, and the onset was gradual subsequent to shock. Case 8 was chronic but characterized by a marked exacerbation.

In our male series we find the incidence to be only one-tenth that in women, the onset to be often of a more acute nature associated with some violent shock, and, further, among the male cases it was more common to find evidence of pre-existing cardio-vascular degeneration.

Concerning male cases, it is interesting to note that while many cases of acute onset occurred in the armies during the war, inquiries by one of us (L. C. R.) at R.N. hospitals at Queensferry, Chatham, and elsewhere failed to reveal a single case after the battle of Jutland or other naval action, and Graves's disease even of insidious onset seems to be extremely rare among sailors. A search through the literature, moreover, has only revealed four cases of doubtful hyperthyroidism.[24]

The male cases show more variation in the state of the tension than do women patients. In the ten cases of the latter, the blood pressure was in each case below normal to an extent varying between 4 and 50 mm. mercury. In the male series, however, one case shows no alteration from the physiological tension we should expect, three show a depression of 7 mm., while the remaining six an increase of tension between 2 and 30 mm. This increase was in practically every case to be explained by complications such as pre-existing arterio-sclerosis or ventricular hypertrophy—for example, in the table Cases 8, 9, and 10 all had definite arterio-sclerosis of older standing.

Patient.	Age.	Blood Pressure.	Blood Pressure Expected in Health (approx.).*	Difference.
		Mm. Mercury.	Mm. Mercury.	Mm. Mercury.
1	23	123	123	0
2	25	118	125	− 7
3	26	150	126	+24
4	28	130	128	+ 2
5	31	124	131	− 7
6	33	140	133	+ 7
7	38	150	138	+12
8	47	140	147	− 7
9	52	160	152	+ 8
10	70	200	170	+30

* Age + 100.

As mentioned previously, the histories of the male cases were frequently of different type from those among women, and six out of ten shown in the table gave a history of acute onset, which may be exemplified in Cases 4 and 7. Acute Graves's disease developed in the latter case after an army action, while patient 4 was a farmer and developed acute symptoms after a fire. He received a severe shock by seeing from a distance his house burning where his wife was lying ill with her young child.

Our conclusions that blood pressure is lowered during the greater part of the course of Graves's disease are reconcilable with the vaso-dilatation as evidenced by the well known and characteristic flushings, feelings of heat, and the moistness and increased electrical conductivity of the skin, and with the secretion by the gland of the previously mentioned depressor substance. The significance of this lowered pressure as the great saving factor in the cardiac condition is obvious, for the overworked and insufficiently rested heart would exhaust itself more readily against an elevated pressure.

It will be noticed that we have shown only the systolic pressures; the diastolic readings we found to be practically unaltered from those occurring in health in people of the same age and sex. Although we believe that in the great majority of cases that come under observation for treatment the blood pressure is low, evidence is accumulating to show that it actually passes through three phases:

1. *A Preliminary Stage of Hypertension.*—This is relatively short, associated with the onset of the disease, and is probably due to peripheral vaso-constriction induced by the action of the exciting stimulus on the suprarenal. It is most easily demonstrated in cases that come on after shock, acute anxiety, or fright.

2. *A Stage of Hypotension.*—This is relatively long, lasting for months or often years. The blood pressure is below the physiological value, the lowered tension being due to vaso-dilatation induced by a depressor substance secreted by the hyper-active thyroid. It is during this stage that the majority of patients seek advice. It may be regarded as the safe operation stage. The heart is usually soft, atonic, and more or less dilated, with reflux at one or perhaps both auriculo-ventricular valves.

3. *A Stage of Secondary Hypertension.*—This is a period of gradually rising pressure which succeeds the second stage after a varying length of time, usually some years, and appears to be associated with two conditions, namely: (1) A reduction of thyroid superactivity, with a consequent relative increase in that of the suprarenal; (2) some secondary change in the cardio-vascular system, such as cardiac hypertrophy.

In each phase, and more particularly the second, diurnal variations are considerable. Our observations have been recorded systematically over varying periods, both before and after surgical treatment, and have shown that after operation an immediate and definite, but temporary, rise in blood pressure occurs. This post-operative rise may be so marked that the pre-operative pressure is doubled; this, we believe, to be caused by the relatively increased action of the suprarenals after removal of a greater or smaller part of the thyroid and the consequent reduction in the supply of the depressor substance poured into the blood, augmented by the great ingestion of fluid which is administered by some surgeons after operation, ostensibly with a view to lowering the toxaemia reputed to result from liberated colloid.* The effect of this post-operative rise in perhaps enormously increasing the work of an already partly exhausted myocardium must be borne in

* This is not borne out by the writers' experience.

mind before advising operation. It is well known that some cases die suddenly from cardiac failure after operation. Death is probably due to ventricular fibrillation, a condition shown by Levy[25] to occur when large doses of adrenalin are injected into the blood stream of animals. Thus it appears to us that, the other factors remaining the same, those cases with the lower pressures will be most suited for operation, since the post-operative pressure will not be sufficiently excessive to seriously embarrass a partly exhausted myocardium, and we may say that this procedure in using the blood pressure as an important indication in selecting cases for operation has been fully justified by results.

We would summarize our more important conclusions as follows:

(*a*) In typical and uncomplicated cases of Graves's disease the systolic blood pressure is usually lower than normal, the diastolic pressure approximately normal, and the pulse pressure consequently low.

(*b*) The systolic blood pressure passes through three phases:

1. *A Short Stage of Primary Hypertension.*—This is associated with the onset of the disease, and due to vaso-constriction owing to suprarenal stimulation.

2. *A Prolonged Stage of Hypotension.*—This is due to peripheral dilatation caused by a depressor substance secreted by the thyroid, and is of variable duration, but usually lasts for years.

3. *A Stage of Secondary Hypertension.*—This comes on late in the disease, and is associated with secondary changes in the cardio-vascular system and reduced thyroid activity.

(*c*) After operation on the thyroid the systolic blood pressure tends to rise. This rise is not infrequently associated with cardiac acceleration and an irregularity of the pulse due to auricular fibrillation, and possibly in extreme cases followed by ventricular fibrillation resulting in death.

(*d*) A low systolic blood pressure in Graves's disease, other factors being equal, indicates from an operation point of view: (i) Little myocardial exhaustion. (ii) A small post-operative rise in blood pressure and consequently little liability to post-operative cardiac failure. (iii) Less haemorrhage.

(*e*) Diurnal variations in blood pressure are considerable in Graves's disease, being relatively greater than in health.

REFERENCES.

[1] Strickland Goodall, The Heart in Graves's Disease, *Practitioner*, July, 1920. [2] H. S. Plummer, *Trans. Assoc. Amer. Phys.*, Philadelphia, 1915. [3] Hirschfelder, *Diseases of the Heart and Aorta*. [4] F. R. Krause and N. Friedenthal, *Berl. klin. Woch.*, 1908, p. 1709. [5] Bain, *Textbook of Medical Practice*. [6] T. B. Scott, *Modern Medicine and Some Modern Remedies*. [7] W. H. Cowing, *Blood Pressure Technique Simplified*. [8] T. C. Janeway, *A Clinical Study of Blood Pressure*. [9] P. Nicholson, *Blood Pressure in General Practice*. [10] Spiethoff, vide [7], also [14]. [11] F. C. Eve, BRITISH MEDICAL JOURNAL, October 3rd, 1914. [12] W. T. Halstead, Abstracts *New York Med. Journ.*, etc., 1914, p. 639. [13] H. French, *Index of Differential Diagnosis of Main Symptoms*. [14] A. E. Taussig, *Trans. Assoc. Amer. Phys.*, Philadelphia, 1916. [15] Hale-White, *Materia Medica*. [16] G. Oliver, *Studies in Blood Pressure*. [17] Hutchinson and Sherren, *Index of Treatment*. [18] Ransom, *Lancet*, September, 1919. [19] Rendle Short, *The Newer Physiology in Surgery and General Practice*. [20] R. McCarrison, *Thyroid Gland*, 1917. [21] Schoborn, *Collected Letters of Mayo Clinic*, 1913. [22] E. Gley, *Journ. de Phys. et de Path. Gén. Par.*, 1911, xiii., pp. 955-970. [23] Blackford and A. H. Sandford, *Med. Record* (New York), 1913, lxxxiv. pp. 378-380. [24] Findlay, *Journ. R N. Medical Service*, iii, 2. [25] Goodman Levy, BRITISH MEDICAL JOURNAL, 1912, ii, p. 627; *Heart*, June, 1913, p. 319.

INTRATRACHEAL ANAESTHESIA BY THE NASAL ROUTE FOR OPERATIONS ON THE MOUTH AND LIPS.

BY

STANLEY ROWBOTHAM, M.R.C.S., L.R.C.P.,

ANAESTHETIST, THE QUEEN'S HOSPITAL FOR FACIAL AND JAW INJURIES, SIDCUP; HONORARY ANAESTHETIST, THE SEAMEN'S HOSPITAL, GREENWICH.

THE following is a brief description of a method of anaesthesia which I have found very useful in plastic operations, and which is recommended for all operative procedures in the region of the mouth. The catheter is well out of the surgeon's way, and his technique is thus rendered more aseptic.

It consists essentially of three manœuvres:

1. Passing the catheter through the nose and nasopharynx.
2. Catching it up in the oropharynx by means of a special guiding rod.
3. Directing it into the trachea.

These may be supplemented by

4. The provision of a return nasal airway, a procedure which is often a great help to the surgeon, in that it prevents bubbling of blood in the mouth and directs expired anaesthetic vapours away from him.

The following instruments are required:

Catheter.—The usual "aseptic" type of tracheal catheter.

Laryngoscope.—Hill's pattern. Illumination is obtained either by an attached distal lamp or by a pencil light pushed down by the side of the laryngoscope.

Guiding Rod.—This is a round rod of metal ⅛ in. in diameter and 10½ in. long. The end for picking up the catheter (Fig. 1, A) is sloped away on its under side (Fig. 1, A, (1) and (2)) for about 1½ in. back in order to allow it to dip more easily from the laryngoscope into the eye of the catheter. The upper side (Fig. 1, A, (2) and (3)) is also bevelled for ½ in. from the end to meet the under side. The terminal ½ in. (Fig. 1, A, (2)) is now tilted upwards until the upper bevelled surface is parallel to, and only very slightly above the level of the upper surface of the rod. This slight tilt gives an upward bend to the catheter which makes its introduction through the cords much easier. The end is rounded off, and there is no sharp edge where the upper and lower surfaces meet. The other end of the rod is curved down to form a handle, bending away so that the operator's hand does not hide his view along the rod.

Details of Method.

Before starting, the end of the guiding rod is pushed from the top of the eye into the solid end of the catheter and a little notch (Fig. 1, B) made for its reception in Stage 2 (Fig. 1, C).

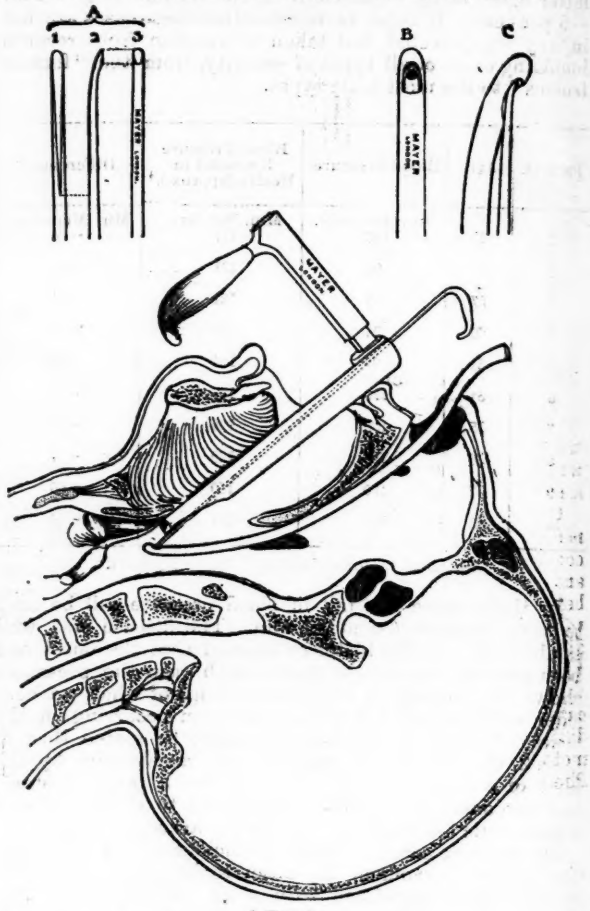


FIG. 1.

1. The passage of the catheter through the nose is usually easy. It should be curved with the eye facing inwards, and, after lubrication with sterile vaseline, passed through the nares with its concavity towards the floor of the nose. Stiff new catheters sometimes strike the back of the nasopharynx and refuse to go on. Rotation of the catheter—or the previous passage along its lumen of a piece of stout wire, the end of which is lodged in the notch for the guiding rod, followed by bending so that there is a very distinct tilt to the end of the catheter—will usually overcome this difficulty. The wire should, of course, be removed before proceeding to the next stage.

2. A view of the catheter is obtained by means of the laryngoscope passed to the back of the mouth. The guiding rod is passed down the speculum and its extremity pushed into the notch in the end of the catheter (Fig. 1), the outer end of the catheter being held meanwhile either between the little and ring fingers of the hand manipulating the rod, or by an assistant. After it has been picked up it is essential that the catheter be held taut outside the nose so that the guiding rod shall remain pushed home in its end.

3. The laryngoscope is now manipulated so that a view of the glottis is obtained, and the end of the catheter directed between the cords by the guiding rod, which is withdrawn before

pushing on the catheter from the nasal end. In an average adult the catheter should be passed for a distance of about 30 cm. from the ala of the nose, or about 5 cm. further than the distance from the teeth required in the oral route. Catheterization is greatly facilitated by the relaxation obtained by a really deep anaesthesia and by the use of a large size laryngoscope.

4. Six pieces of ordinary rubber tubing (sizes 22, 24, 26, 28, 30 and 32 French catheter gauge, walls 2 mm. thick) are smeared with sterile vaseline, and, starting with the smallest, rapidly passed one after the other through the opposite naris. This manœuvre gradually dilates the nasal passage, and enables a tube large enough to provide a sufficient return airway in most cases to be used. The length of tubing to pass may be roughly estimated by the distance between the patient's ala and the external auditory meatus of the same side; but the most suitable length can really only be found by trial in each case, a good return airway with the end of the tube as near the glottis as possible being the aim. A metal angle piece may be fitted into the outer end of the tube to direct the anaesthetic vapour away from the surgeon, and prevent towels obstructing the airway. The back of the mouth is now packed with a long strip of gauze.

Fig. 2 illustrates the method in use during a plastic operation on the lips. A sufficient nasal return airway

FIG. 2.

cannot always be obtained in this manner, but occasionally it may be improved by increasing or decreasing the degree of extension of the neck. Again, it is sometimes found that if a tube which has remained in for a short time and dilated the nasal passage be removed, the larger airway obtained by its removal proves sufficient.

Occasionally, when the catheter is passed through the nose with a wire in it, as described above, and pushed on, the cough characteristic of its passage into the trachea occurs, and, on inspection, the fact that it has actually passed between the cords is confirmed. Working on this, attempts were made to judge the curve on the catheter required to direct its end towards the mid-point of the thyroid cartilage after passage through the nose; but so far experiments have shown this to be a very uncertain method of tracheal catheterization, the correct curve for each case being very difficult to estimate. The guiding rod, nasal tubes, and metal angle piece were made for me by Messrs. Mayer and Phelps.

A CASE OF CEREBELLAR TUMOUR.

BY

R. T. WILLIAMSON, M.D., F.R.C.P.,

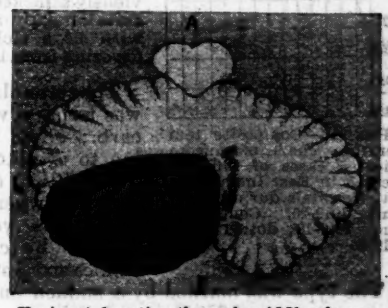
CONSULTING PHYSICIAN TO THE ROYAL INFIRMARY, MANCHESTER.

WITH respect to the ataxia in localized cerebellar tumour, different statements have been made in British and foreign medical literature as regards the side to which the patient tends to fall when attempting to walk. By some distinguished British and Continental physicians it is stated that, in the ataxia of cerebellar tumour, when the patient walks there is no constant relation between the side to which he tends to fall and the side of the tumour. By others it is stated that the patient tends to fall to the side of the lesion. According to some physicians, when the posterior part of the middle lobe of the cerebellum is affected the patient tends to fall backwards when walking; and when the anterior part is affected the patient tends to fall forwards.

The abstract of the notes of the following case may be of interest, because it tends to support the view which has been expressed by certain English physicians with respect to the direction in which the patient tends to fall. The case is an instance, also, of the deviation and rotation of the head described by Dr. Grainger Stewart and Dr. Gordon Holmes "as occurring in certain cases of cerebellar tumour."

M. G., a man aged 45, was sent to me by Dr. Sawers Scott. When first seen his chief symptom was headache. The optic discs were then normal, and no symptoms of cerebellar disease or other localized organic brain disease could be detected. I did not see the patient again for many months. When I next examined him definite symptoms of cerebellar tumour had developed. He complained of severe headache, and on examination the following were the chief symptoms: Double optic neuritis; internal strabismus of the left eye; paralysis of the left external rectus muscle; diplopia; ataxic gait; definite tendency to fall backwards and to the left when walking—the last symptom, at the end of the illness, was very well marked; also when standing or sitting the head was tilted or rotated, so that the chin was directed, or approximated, to the right shoulder.

The autopsy revealed a cerebellar tumour. It was situated at the posterior part of the cerebellum, just under the tentorium. It affected the posterior half of the middle lobe (or vermis) and extended to the left lobe, affecting almost the whole of the posterior half of this lobe, but it only affected a very small portion of the right lobe, quite close to the middle lobe. The growth extended both to the upper and lower surfaces of the posterior half of the left lobe of the cerebellum, but it was most extensive in the central or middle portion of this lobe. The dentate nucleus was seen outside the growth on the right side. The growth occupied the position of this nucleus on the left side and the position of the roof nuclei in the middle lobe. The growth was a plexiform angio-sarcoma, the cells being chiefly spindle cells.



Horizontal section through middle of cerebellum. Position of tumour shaded.

A NOTE ON INFLUENZA IN INDIA, 1918–20.

BY

H. G. WATERS, M.R.C.S., L.R.C.P., D.P.H.CAMB., D.T.M. AND H.,

CHIEF MEDICAL OFFICER, EAST INDIAN RAILWAY.

MY report on influenza, published in February, 1919, gives an account of the result of treating the 1918 influenza outbreak by stimulants instead of by the usual depressant mixtures containing salicylates. It records the treatment of 28,859 cases, with 509 deaths—a case-mortality of 1.7 per cent.

The second outbreak in 1920 gave a general impression to all my staff of medical men, numbering almost 100, that one attack of influenza protects the individual against a second attack. The following definite records, although of small numbers, are so confirmatory of this impression that we may, I think, accept them as proving that "one attack of influenza protects against a second," as much as measles does. The cases recorded were all clear to type, and not catarrhal cases, so often miscalled influenza.

At the three Oak Grove Schools, Mussoorie, we have a population of:

Boys' school	220
Girls' school	118
Junior boys	105
Junior girls	72
Staff (includes families)	56
Clerks ,, ,, ...	9
Menials ,, ,, ...	225
	805

To attend on these we had one medical officer, two sub-assistant surgeons, and eight nurses. The records and attendance were therefore probably much better than those furnished in the average case. Every one of the nurses in turn contracted the

disease; these are included in "staff sick." In the 1918 October outbreak 195 cases occurred amongst the European and East Indian population, with four cases of pneumonia, of whom one died, giving a case mortality of 0.35 per cent. Thirty cases occurred amongst the menials, with a case mortality of 3.3 per cent. Thus there were 225 cases out of a population of 805.

In March and April, 1920, we had a second outbreak. Population the same as recorded above. There were 55 cases amongst the Europeans and East Indians with no death; 79 cases occurred amongst the Indians with 4 deaths. Thus there were 134 cases among 805 population. Of these two only had had a previous attack of this disease.

At Bishop Johnston's Orphanage there are 60 girls, and at Colvin Free School 100 boys. The two school residences are a mile apart on opposite sides of the railway. The girls walk daily to the boys' school, where they are taught in mixed classes. In September, 1918, influenza started amongst the girls and their school attendance was prohibited; 50 per cent. were attacked, with no death. There were two doubtful fever cases amongst the boys. In February, 1920, influenza started in the boys' school, and school attendance was continued by the girls; 46 boys out of 100 were attacked, while of the girls 10 only developed the disease, none of those previously attacked suffering; this in spite of daily association in class with boys sickening for and recovering from influenza.

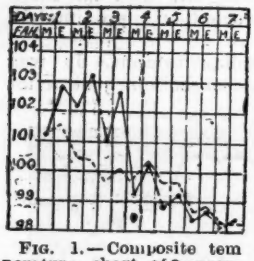


FIG. 1.—Composite temperature chart of uncomplicated cases of influenza treated in East Indian Railway Hospitals during 1918–19 and 1919–20. Continuous line = 1918–19; dotted line = 1919–20

The stimulant mixture used was tr. nucis vomic. and ammon. carb.; other treatment according to symptoms. The figures for the 1920 outbreak were not complete when I left; the treatment this year was supplemented by camphor and nux vomica extract pills.

The type was marked by a sudden onset, with a rise of temperature to 103° F. in a few hours; severe headache, nasal catarrh, pains in limbs and body, slow pulse (80 per minute in spite of the high temperature) and very marked prostration.

Combined charts showing the relation of the temperatures for 1918 and 1920, simple and complicated with pneumonia, are reproduced herewith.

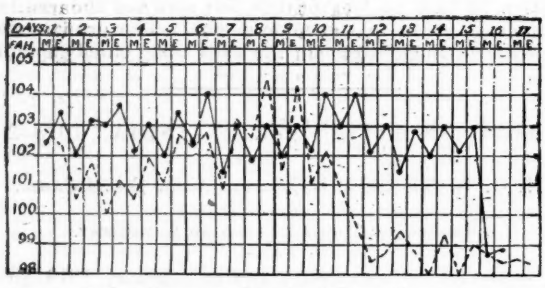


FIG. 2.—Composite chart of twelve influenzal pneumonia cases treated in East Indian Railway Hospitals during 1918–19 and 1919–20. Nearly every case was one of double pneumonia terminating on the fifteenth day. Continuous line = 1918–19; dotted line = 1919–20.

In 1918 every pregnant woman attended for influenza, with one exception, aborted and died of *post-partum* haemorrhage, four were under treatment in hospital; neither pituitrin nor ergot seemed to have any action on the uterine muscle. There was no special age or sex incidence.

THE twenty-sixth congress of the Italian Society of Internal Medicine will take place at Rome from November 3rd to 6th, when the following subjects will be discussed: Bronchial asthma, introduced by L. Giuffré and C. Frugoni; lymphogranulomatosis, by C. Moreschi and A. Ferrata; and clinical electrocardiography, by P. Sisto. Further information may be obtained from R. Clinica Medica, Policlinico Umberto 1, Rome.

ACCORDING to the report of the medical officer of health for Winnipeg, the death-rate for 1919 was 11.49, compared with 14.74 for 1918. The infant mortality rate was 106.9 per 1,000 living births; the birth rate was 28.65. There were 150 cases of typhoid fever, with 19 deaths. During the outbreak of encephalitis lethargica, which prevailed throughout the Western Provinces during the later months of the year, 81 cases occurred in Winnipeg, with 31 deaths; in no instance was a connexion traced between any two cases.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

TRAUMATIC OBSTRUCTION OF DUODENUM: OPERATION: RECOVERY.

THE following case came under my care in France:

A driver of a three-ton motor lorry started his vehicle by swinging the starting handle. He had omitted to put his gear "into neutral"; the lorry moved forward, and before he could jump clear his belly acted as a buffer between his own lorry and another standing in front. A comrade who witnessed the accident stopped the engine and extricated him, but not before the impact had pushed the front lorry several yards. This occurred in the morning. When I saw him in hospital about two hours after the occurrence there were no symptoms whatever, excepting slight redness and pain (which was not severe) over the epigastrium; the pulse was 76 and of good volume, and there had been no vomiting. He stated that he did not feel at all ill. He was put to bed and given small quantities of liquids only; the same evening, apart from slight pain over the epigastrium, there was nothing to note. Next day the patient desired to get up and to have a solid meal; neither was allowed. On the third day, at 11.30, he complained of feeling sick and vomited liquid food, tinged with bile, but containing no blood, fresh or altered. Examination of the abdomen, etc., revealed no rigidity, and the tenderness over the epigastrium had practically gone. During this day he vomited several times, with increasing frequency; the vomit contained more bile, and the patient's general condition was decidedly on the downgrade. On the evening of this day the stomach was found to be dilated. A diagnosis of duodenal obstruction was made. This was confirmed by *x* rays, which showed that the obstruction was located in the second and third portions. On the morning of the fourth day the patient's condition had not improved; he was still vomiting and the vomit contained much bile. At laparotomy I found that the duodenum showed no signs of trauma, but was very markedly pushed forward and to the left; the distortion was due to a large retroperitoneal haematoma, the size of a large hen's egg, situated over the right psoas magnus. The haematoma was incised vertically, and a handful of blood clot was removed; there was little bleeding, and the peritoneum was closed. The patient made an uneventful recovery, and during his convalescence never vomited.

The case is interesting in that, despite tremendous compression of the belly, the viscera were undamaged, and also in the delayed appearance of symptoms of disordered function and of obstruction of the duodenum.

Parkend, Troon, N.B. F. J. STRACHAN, M.B., B.S.

THE INCIDENCE OF WORM INFECTION IN INDIAN TROOPS OF THE EGYPTIAN EXPEDITIONARY FORCE.

DURING the six months July to December, 1918, specimens of faeces were examined from 2,002 patients in No. 45 Indian General Hospital, Cairo. Worm infections were found in the following numbers:

Ankylostomum (including Necator) in ...	568
Ascaris lumbricoides in	138
Trichuris in	68

During this period 9,937 patients were admitted to hospital in both the medical and surgical divisions.

The cases examined were partly selected as clinically suggestive of worm disease and partly were taken at random. Practically all came from Palestine.

Reduced to percentages, the above figures represent:

Ankylostomum among those examined ...	28.3 %
,, among total admissions ...	5.7 %
Ascaris among those examined	6.8 %
among total admissions	1.3 %

I am indebted to the officer commanding No. 45 Indian General Hospital for permission to publish the above figures.

F. H. STEWART, M.D., D.Sc., Lt.-Col. I.M.S.,
Lately Medical Divisional Officer, No. 45 Indian General Hospital.

FISH BONE IN WHARTON'S DUCT.

ABOUT the end of May, Mrs. H. complained of having a "fish bone stuck in her mouth"; she said that while eating "fish and chips" she had felt the pricking of a bone on the left side of the mouth.

Careful examination in direct and reflected light and palpation with the finger failed either to find the bone or to demonstrate any painful area. Four months afterwards the

patient returned, stating that she had had "a cold," and that on the previous day when coughing heavily she had felt a pricking sensation under the tongue. During the night she had begun to have swelling and pain under the left side of the jaw. In addition to enlargement of the left submaxillary gland I found that the floor of the mouth was fuller on that side than the right; the track of Wharton's duct could be seen, and was palpable and tender. The papilla was red and more prominent than its fellow, which was pushed a little to the right. The mucous membrane was anaesthetized and the duct was picked up with a dissecting forceps; it was manifest that there was something inside, like a stilette in a catheter. An attempt to push the foreign body out through the opening of the duct was unsuccessful. A tiny incision revealed the fish bone, which was easily extracted with another forceps. It was three-quarters of an inch in length, with blunted ends.

The patient stated that from her first visit to the day previous to her second visit (four months afterwards) she had had no pain or discomfort. Probably the opening of the duct became blocked by the end of the bone by reason of the force of the coughing.

Heeley, Sheffield. JAS. D. MACKAY.

A LARGE URETHRAL CALCULUS.

THE following case of urethral stone appears to be of sufficient interest to justify its brief report.

The patient, a male aged 21, was attached to the Indian Army in Mesopotamia. He reported sick, complaining of incontinence of urine, and of slight haematuria; the point of a metal catheter was found to impinge upon a stone in the membranous urethra; calculus was also palpable by rectal examination. A Wheelhouse's perineal section was performed and the stone removed from the enormously dilated urethra, which was sutured over a No. 10 catheter. The wound was loosely closed and a gauze drain inserted, passing down to the urethra. Recovery was uneventful. The wound was completely healed on the twelfth day, when control of micturition had returned and a No. 10 metal catheter passed with ease.

The calculus was largely composed of phosphates, it was two inches in length and weighed 6¾ drachms.

Derby. SIDNEY B. RADLEY, M.B., F.R.C.S.

Reports of Societies.

MEDICAL REQUIREMENTS FOR AIR NAVIGATION.

AT a meeting of the War Section of the Royal Society of Medicine on October 11th Wing-Commander MARTIN FLACK lectured on medical requirements in air navigation. The selection of a flying officer, he said, was a task in which the clinician and the physiologist must co-operate, though in his lecture he intended to deal with the subject mainly from the physiological point of view. It was evident that, no matter how much research might be put into the flying machine itself, there always remained the fact that the man who stepped into the machine became from the moment he did so its controlling and co-ordinating mechanism, and it was as necessary that the human mechanism should be intact as that the aeroplane itself should function efficiently. In the first place, the past history of the candidate, both family and personal, must be inquired into. If the candidate had at any time suffered from malaria or dysentery it was a matter for particular attention, and often for a specialist's report. Men who had a history of head injury or of severe surgical operations of any kind were generally ruled out. In America and also in Italy there had been a great deal of psychological study of prospective fliers. Mental aptitude for flying was, however, difficult to assess. Whether it was right to put a candidate through a psychological examination he was not prepared to say, but, at any rate in this country, it had seemed better to the authorities to cross-examine the candidate with regard to his experience and capacity—as, for instance, his prowess in games which required the co-operation of eye, hand, and leg—rather than to institute one set examination on a single occasion to discover his psychological value. Testing of the psychomotor responses had been carried out, but even this was of more use in picking out the fatigued man than in selecting the new flier. The examiner must always bear in mind also how certain psychological qualities might develop in a man during his period of actual instruction with the machine, although these were only rudimentary or scarcely to be observed at all at the time of the preliminary observation.

In view of the controlling and co-ordinating functions which the airman had to exercise, the possession of certain sensory attributes was of very great importance, and of these the most important undoubtedly was the visual. The pilot must possess good visual acuity, and in most cases it was particularly necessary that he should have ocular muscle balance, as without this his landing capacity was likely to be very seriously affected. An examination of those who had gained distinction in flying revealed the fact that although perfect visual acuity might not be necessary, even for air fighting, yet any large defect was a reason for rejection, and the visual test must be kept severe. Next in importance to vision came muscle co-ordination and cutaneous sense. The flier must have the "feel" of the "joy-stick," of the seat, and of the back, also of the blowing of the wind in his face. Muscle sense played a very large part in good flying. The flier also derived impressions from hearing, as, for instance, the singing of the wires. It did not appear, however, that the vestibular apparatus was of great use, seeing that, if it were, the airman should not lose his way in fog, and yet a great many very expert pilots had confessed that in a fog they were completely lost. The semicircular canals would give a man information with regard to his own position in relation to the machine, but no information, usually, with regard to his position in relation to the earth. At the same time the lecturer would not say that the semicircular canal tests were altogether useless, only no fixed rules could be laid down. Certainly some of our very best fliers would have been "ploughed" by the American standard in this respect. The vestibular mechanism should be intact, of course; there should be no gross ear disease, and it was very important to rule out Eustachian obstruction, for this impeded the equalization of pressure at varying altitudes. This equalization of pressure must pertain to both ears.

With regard to respiratory capacity, the lecturer pointed out how necessary it was that this should be adapted to the special needs of high altitudes. Seeing that it might be necessary to fly high, the airman must have a good air intake, and particularly good expiratory efficiency. The pulse was a crucial test of the airman. If, when a candidate was asked to raise his body weight on to a chair five times in fifteen seconds, his pulse increased 36 or more, and the time taken to return to normal was more than thirty seconds, he was to be looked upon with suspicion. A great deal could be predicted with regard to efficiency from the mere feel of the pulse. The pulse of the successful airman was soft, harmonious, easy working, like a sure machine, and it was very important that only men with such a pulse should be taken as fliers. A high diastolic pressure within the normal limit was undoubtedly very essential. He showed a list giving the capacities in various respects of airmen who had gained distinction; the general result was that all these men were capable of holding the breath for from fifty-five to seventy seconds, and their vital capacity was above 3,800 c.cm. Adaptation to altitude seemed to be a matter of respiratory efficiency, circulation, and also, possibly, concentration in the blood.

Lieut.-General Sir JOHN GOODWIN, Director-General of the Army Medical Service, in proposing a vote of thanks to Wing-Commander Flack, said that he had had a conversation with an airman who had gained the Victoria Cross while flying, and this officer had told him that when he got into the clouds he lost all sense of direction, and did not know until he emerged whether the earth was above him or underneath.

THE forty-fifth annual report of the Mission to Lepers shows that the expenditure for 1919 was £25,980 more than in any previous year. Grants were made towards work for lepers at Vengurla in South India, Palo Seco (Panama), and Tong Yung (Korea); an asylum has been opened at Cuttack, Orissa. The Mission has received much aid in India and in the United States of America.

Reviews.

IRRITANT GAS POISONING.

THE first publication of the Anthony N. Brady Memorial Foundation is a very fully illustrated account, entitled *The Pathology of War Gas Poisoning*,[1] of the anatomical changes—gross and microscopical—found in dogs as a consequence of experimental exposure to a variety of irritant gases used in the late war. The work recorded in the volume was done under the direction of Major MILTON C. WINTERNITZ, M.D., by the branch of the Medical Science Section of the U.S.A. Chemical Warfare Service concerned with pathology.

The book is devoted to an examination of pathological changes, and only mentions incidentally something of the properties of the gases used and their physiological effects. It is divided into sections on the pathology of poisoning by chlorine, phosgene, chloropicrin, superpalite and palite, mustard gas, cyanogen chloride and bromide, arsine and organic arsenic compounds. The greater part of the experimental work was done with the first three gases. Sections are also devoted to a preliminary study of intratracheal therapy and the significance of haemorrhages in residual pulmonary lesions. Each section is profusely illustrated. There are in all forty-one coloured plates of uniform excellence, and numerous black-and-white reproductions of microscopical sections, a few of which are not quite up to the high standard of the remainder. The general plan adopted is to classify the dogs employed in groups according to the length of time elapsing between gassing and death, and to describe the pathological changes found to be characteristic of each group and the transition from one group to the next. The detailed carrying out of this scheme varies somewhat with the different gases.

The largest amount of work was done on the effects of chlorine, and the conclusions reached are the result of the examination of the tissues of 326 dogs poisoned by this gas. These dogs could be divided into four groups: (1) those dying in the first twenty-four hours—acute death; (2) in 2 to 5 days—delayed death; (3) in 5 to 15 days, and (4) those surviving 15 to 193 days, chronic or recovered cases. The pathological changes, both gross and microscopic, were found to be markedly different in the various groups, but it was possible to trace development of the lesions throughout the series. Unfortunately, many different concentrations of gas were used, but a full record is not given, and this detracts from the value of the tables. The simple effects of the gas were found to be complicated by secondary infections and inflammation after about six hours. Some bacteriological results are given. Death was due in the acute stage to oedema, in later stages to infections. Two factors appear to play an important part in causing the emphysema and atelectasis so characteristic of chlorine poisoning: (1) obstruction of bronchioles by dead epithelium, and (2) by muscular spasm. Vital staining was employed to show that chlorine kills the epithelium directly, not as a secondary result of oedema. An interesting observation, in view of the chronic symptoms of patients who have recovered from chlorine poisoning, is the severity of emphysema and bronchiolitis obliterans in the dogs which survived for long periods.

It was found that the histological effects of widely varying concentrations of phosgene were much the same, only the time of development of symptoms being altered. The selective action of phosgene on the deeper parts of the lungs is attributed to its decomposition with formation of hydrochloric acid. The effects of chloropicrin were intermediate between those of chlorine and phosgene. Death in the case of poisoning by this gas is attributed to interference with the circulation by fibrin formation and increased viscosity of the blood. No account is taken of defective gaseous exchange and consequent anoxaemia, which would appear to be highly probable consequences of the anatomical changes demonstrated. A full account is given of the effects of mustard gas, and its destructive effect on epithelia is contrasted with the oedema-producing action of other gases—for example, chlorine. Other gases are treated more briefly, and it is unfortunate that the number of dogs examined is not stated in the case of some of the gases.

The section on intratracheal therapy relates the resumption of work originally undertaken in connexion with pneumonia, and is based on the theory that impairment of the protective mechanism of the upper respiratory tract facilitates the attack of bacteria on the bronchioles and lung tissue. It was found that pulmonary irrigation was possible without ill effects, that absorption from the lungs was rapid, and that materials introduced as indicators could be washed out of the lungs.

The book forms a valuable record of the anatomical effects of some irritant gases on one species of animal, the dog, and the authors do not fail to draw attention to the different effects found in different species. Perhaps some account of the effects of other gases, such as H_2S, might have been included with advantage. The work recorded is highly specialized, and its full value will only be appreciated by simultaneous consideration of the physiological and clinical effects of the gases in question, for an account of which other works must be consulted. The plates and printing of the book are excellent, and few misprints were noticed. On p. 31 Bancroft should be Barcroft, and the formula for palite, or chloromethyl-chloroformate (p. 91), should be $ClCOOCH_2Cl$.

A list of the papers cited is given at the end of some of the sections, but these lists do not form a complete bibliography—for example, most of the histological work on gas poisoning carried out for the Chemical Warfare Medical Committee in this country is not mentioned.

[1] *Collected Studies on the Pathology of War Gas Poisoning.* By Major Milton C. Winternitz, M.D., M.C. U.S.A. New Haven: Yale University Press; London: H. Milford. 1920. (Med. 4to, pp. 185; 41 plates, 8 figures. 84s. net.)

SYPHILIS.

Too many writers on syphilis are content to treat of the disease in its regional aspects and to ignore the disease as a whole. In his admirable textbook[2] Dr. HENRY H. HAZEN has been careful to avoid this fault, for, beginning with a consideration of the primary sore, he traces the morbid processes through their involvement of skin, bone, the nervous system, the eye, and almost every tissue of the body. Indeed, the enumeration alone of the many forms of disease which may be the result of syphilitic infection is startling evidence of the havoc wrought to the community by this universal scourge. To this aspect—the economic—the author refers particularly; he makes the statement, based upon most sound data, that a loss every year of nearly half a billion dollars results to the United States alone from this cause.

As in all morbid processes, but in the case of syphilis perhaps more than others, effective treatment depends very largely upon early diagnosis. It is in the primary and secondary stages that cure is possible, and, indeed, were our methods more perfect, or perhaps were they carried further, much of what appears in this book would be unnecessary or only of historic interest. The author has very properly devoted a considerable amount of space to the consideration of the cutaneous eruptions. He also adverts—and in this he will have the approval of all engaged in the study of venereal diseases—to the far too common custom of ignoring clinical evidence and attaching undue importance to laboratory findings. It is beyond dispute that information of the most valuable kind is to be obtained from the "Wassermann" test. The difficulty lies not in the test itself, but in its interpretation. The truth of this statement finds complete demonstration in the table on page 499, in which the results obtained from the examination by the Wassermann method of 5,600 cases of declared syphilis are recorded. Taking the disease as a whole, in 14 per cent. the result was negative; in secondary cases 4.9 per cent. gave a negative result, and this at a period when the highest proportion of positive results is expected. When it is stated that these tests were carried out by a pathologist of such established reputation as Colonel Craig, doubt as to their accuracy will not be entertained.

Dr. Hazen is fully conscious of the magnitude of the task he has set himself in the compilation of this book. He puts the matter clearly in the preface when he says that to know syphilis means to know the entire domain of

[2] *Syphilis: A Treatise on Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis, and Treatment.* By Henry H. Hazen, A.B., M.D., Professor of Dermatology and Syphilology, Medical Department of Georgetown University, etc. London: Henry Kimpton. 1919. (Roy. 8vo, pp. 647; 160 figures, 16 in colours. 36s. net.)

medicine, and that for any one man this is impossible. He has therefore sought the help of a number of other specialists whose contributions are in no small measure responsible for the success of the venture. In the section descriptive of the Röntgen-ray diagnosis of bone and visceral disease, for example, he is associated with Dr. Van Sweringen, and their combined labours have produced, on an aspect of this disease somewhat neglected by other writers, an attractive chapter, well illustrated by means of *x*-ray pictures.

While a necessary caution is given against the mistake of relying too much on the laboratory methods of diagnosis, this part of the subject has not been neglected. Both the Wassermann technique, and the methods used for detecting the *Spirochaeta pallida* are thoroughly discussed and explained. We cannot refrain from comment upon one point made by the writer of this section, Colonel Craig—namely, the effect of an alcoholic debauch in converting a positive result into a negative. Is it now possible for such a dilemma to arise in the United States? Nevertheless, since the book is assured of a ready audience among European readers, knowledge of this sort will not be wasted.

This is a well balanced and sane book, covering the wide ground in a remarkably skilful manner without unduly overloading any part. To each chapter is appended a full bibliography where the reader will obtain a guide to other sources of information.

OPHTHALMOLOGICAL TEXTBOOKS.

THE new edition of WEBSTER FOX'S *Practical Treatise on Ophthalmology*[3] is written on conventional lines. It will probably be of more use to the ophthalmic surgeon and to the senior clinical assistant than to the student who is only beginning the study of diseases of the eye, for it is written in rather a diffuse, discursive style, and in the sections on treatment especially the student is given too great a variety. It would have been preferable had the author limited his remarks on treatment to well tried methods, and if he had refrained from describing quite so many operations when dealing with diseases of the lids. A textbook should not aim at being an encyclopaedia; and the student who reads the accounts of the different operations for such conditions as ptosis and entropion will be greatly puzzled as to which of the many methods he should prefer. Some of the contents are of theoretical interest rather than of practical value—for instance, the use of dionin and of subconjunctival injections; we doubt whether opinion in this country is much in favour of either, though it is only fair to add that, so far as we know, they do no harm. The ophthalmic surgeon will be interested in the description of a new operation for conical cornea, and in the chapter on retinal diseases, which is one of the best in the book. Paper, printing, and illustrations are exceptionally good. As a very minor criticism, we would point out that the Royal London Ophthalmic Hospital is known as the Moorfields Hospital, not as the Moorfield's; probably this was a typographical error.

The fourth edition of CURT ADAM'S pocket-book of ophthalmic diseases[4] does not differ materially from previous editions, save that the present has been brought up to date by additions to and, where required, amplification of the sections dealing with local and general therapy. For those acquainted with the German tongue this book can be safely recommended as of the nature of "first lines" to its subject. Some of the chapters—those, for instance, on injuries and on diseases of the conjunctiva—are very good; we regret to see that in dealing with cases of raised tension accompanying iritis, the advice is given to discontinue the use of atropine and to use miotics; this is the usual advice given at this point in German textbooks, but it should give place to paracentesis of the anterior chamber, coupled with a continuance of atropine or some other mydriatic; this form of treatment has been found to give beneficial results in the majority of cases. A convenient formulary with a subsection of maximal doses, and a very full index, add materially to the value of the book. The paper and printing are good.

[3] *A Practical Treatise on Ophthalmology.* By L. Webster Fox, M.D., LL.D. Third edition. New York and London: W. Appleton and Co. 1920. (Roy. 8vo, pp. 857; 303 figures, 6 plates. 35s. net.)

[4] *Taschenbuch der Augenheilkunde, für Aerzte und Studierende.* By Professor Dr. C. Adam. Fourth edition. Berlin and Vienna: Urban and Schwarzenberg. 1920. (Cr. 8vo. pp. 408; 72 figures, 5 plates. M. 66.)

OBSTETRIC TEXTBOOKS.

DR. FREDERICK E. LEAVITT'S *Operations of Obstetrics*[5] is a pleasantly written and attractively illustrated volume, based avowedly not so much upon the author's experience as upon the writings of others. This is the source of the weakness that impairs the value of the book throughout. There is not behind the writing that weight of personal experience which gives the ring of authority. Apart from that it is a creditable and commendable book. It is disappointing to find Dr. Leavitt still employing forceps with solid blades, and discarding any scientific attempt to obtain real axis traction. True it is that the hand that guides the forceps is more important than the instrument itself; but Dr. Leavitt ought to remember that he cannot transmit to his pupils the skill of his own hand, whereas he can teach them to use with reasonable skill the instrument that is most perfect in design. Mere familiarity in the use of an imperfect weapon is no reason—particularly on the part of a teacher—for failing to strive for familiarity with improved weapons. It is disappointing also to find that Dr. Leavitt makes no mention of the use of the forceps as a rotator in cases of persistent occipito-posterior positions. In discussing the operative treatment of tubal pregnancy, the author asks the question, "Shall the unaffected tube be removed?" To this he says most obstetricians would answer "Yes." And he proceeds, "Knowing how apt pregnancy is to follow in the other tube, it seems rational to excise it." It is comforting to think that in this country at least most obstetricians would answer Dr. Leavitt's question with an emphatic "No," provided the other tube were otherwise healthy.

We congratulate Dr. T. W. EDEN on the fifth edition of his well known *Manual of Midwifery*.[6] The latest edition differs in no material particular from its predecessor, but the book has been revised and some new matter introduced in regard to the management of normal labour. An eminently safe guide to obstetrical practice, Dr. Eden's attractively written manual bids fair to pass through many future editions.

Professor DONALD'S little handbook for midwives, *An Introduction to Midwifery*,[7] has reached its eighth edition. At this date it were a work of supererogation to descant upon the merits of the teaching contained in it. But we would like to express our pleasure at seeing the antique woodcuts of previous editions replaced by illustrations rather more worthy of the book.

LESIONS OF NERVES.

THE original monograph of Mme. ATHANASIO-BENISTY on the nerve injuries of warfare—of which an English translation was published in 1918—is familiar to most students of neurology. The author, in a concise little manual, *Les Lésions des Nerfs*[8] now presents what is practically a new edition of the second volume of the translation. In it the section dealing with operative treatment has undergone amplification. The important question of failure of regeneration after suture is considered, and a sound working rule is laid down—namely, that two years should elapse before a case is written down a complete failure. For the repair of large defects in nerve trunks, the value of nerve grafts is considered to be proved, and their use advised not only in irreparable lesions, but also as an alternative to the extensive freeing of nerve trunks and the postural relaxation obtained by acute flexion of joints which might allow of end-to-end

[5] *The Operations of Obstetrics.* By Frederick Elmer Leavitt, M.D. London: Henry Kimpton. (Med. 8vo, pp. 466; 248 figures. 30s. net.)

[6] *A Manual of Midwifery.* By Thomas Watts Eden, M.D., F.R.C.P., F.R.C.S.E. Fifth edition. London: J. and A. Churchill. (Demy 8vo, pp. viii + 747; 369 figures, 5 plates. 24s. net.)

[7] *An Introduction to Midwifery.* By Archibald Donald, M.A., M.D., F.R.C.P. Eighth edition, revised. London: Griffin and Co. (Cr. 8vo, pp. 202; 70 figures. 6s.)

[8] *Les Lésions des Nerfs: Traitement et Restauration.* By Mme. Athanasio-Benisty. Paris: Masson et Cie. (Cr. 8vo, pp. viii + 156; 66 figures. Fr. 7 net.)

approximation. The recommendation of nerve grafts is based on the later experimental investigations of Nageotte, who has shown to the satisfaction of the French school that heterogenous grafts preserved in alcohol are to be preferred to autogenous grafts. It is stated that signs of recovery have been observed after a number of these operations. In the opinion of the author and her surgical associates, end-to-end suture and nerve grafting are the only logical methods of nerve repair; such operations as the turning down of flaps, tubulization, or nerve anastomosis are to be condemned.

The work is an admirable exposition of the views of the French school of neurologists on the pathology, treatment, and clinical features of recovery of injuries of peripheral nerves. From the practical standpoint its value would be enhanced by the inclusion of actual detailed authoritative statistics of the late results of operative treatment in the many cases which have passed through Mme. Athanasio-Benisty's hands.

NOTES ON BOOKS.

IN *The Control of Parenthood*[9] the subject is discussed from the biological, economic, social and religious, and the imperial and racial aspects, by nine writers, who present their divergent views in a series of essays. In a dignified introduction the Bishop of Birmingham directs the wedded couple to "view the office of parenthood as awful in its majesty and perfect in its beauty." From the biological standpoint Professor J. Arthur Thomson, after balancing the pros and cons, commits himself to the opinion that the good side of the reduction of the birth rate deserves more consideration than it usually receives, and that it makes for race saving and not for race suicide. Dr. Leonard Hill believes that it is untrue that abstinence from sexual life is harmless, and states that the effect of contraceptives is injurious, thus agreeing in the second though not in the first conclusion with Mrs. Scharlieb, who strongly opposes their use on moral grounds. As the unphysiological conditions of slum life render a restriction of the birth rate advisable, he advocates emigration and a natural sexual life. Writing as an economist, Mr. Harold Cox strongly supports the Malthusian tenets, and incidentally meets arguments brought forward, from the imperial and racial standpoint, by Sir Rider Haggard in favour of increase and multiplication of our citizens in order to assure the future of the empire against Eastern perils in the future. Mr. Harold Cox is not impressed by the condemnation of birth control by some members of the medical profession in face of the statistical fact that the birth rate among medical men is lower than that of almost any other class in the community. Dr. Marie Stopes, whose views are criticized at some length by Mrs. Scharlieb, advises conscious elimination of all diseased and overcrowded lives before their conception, by planning to conceive those only for whom adequate provision of material needs and a loving welcome can be reasonably anticipated. The Dean of St. Paul's contribution is remarkably broad-minded and from its impartiality should be read as the first of the series. Sir Rider Haggard writes on the danger of race suicide, and reiterates his conviction that the root of the trouble is the desertion of the land for the cities.

The third edition of Professor RICHARDS'S *Practical Chemistry*[10] supplies students of chemistry, medical students, and dental students with a clearly written and somewhat pedestrian elementary account of qualitative analysis, the preparation of various salts, volumetric analysis, and elementary practical toxicology. The book is written, one may say, largely to the order of certain examination syllabuses; it is thoroughly practical, and should be of service to those for whom it is intended.

Under the title *Electric Ionization*[11] Dr. FRIEL has published a monograph on ionic therapy designed as a practical introduction to its use in medicine and surgery. Following three short chapters on ionization and the electric current, equipment, and the effects of different ions, the final portion is devoted to details of treatment. This latter part is all the more valuable as it is evidently based upon the author's own work and experience. There are many practical and useful illustrations and diagrams. As an introduction to the study of a special form of treatment the book is well set out and can be recommended.

In spite of the fact that there are already several large textbooks on diseases of the eye in the German language —for instance, those of Fuchs, Axenfeld, and Römer, to name only three of them—Professors BRÜCKNER and MEISNER, the Oberarzt and First Assistant in the University Eye Clinic in Berlin, have brought out a large volume entitled "Outline of Ophthalmology for Students and Practitioners."[12] The price is certainly reasonable. The subject is dealt with on conventional lines, and is divided into four parts, the first of which deals with anatomy, development, and physiology; the second, and by far the largest section of the book, is devoted to special pathology, in which are found descriptions of the various diseases of the eye; the third part deals with methods of examination, and would in our opinion have been placed earlier in the volume with more advantage to the student; the final part deals with treatment—medical physical, and operative; it must not be thought from this that the appropriate treatment for the different diseases described in the second part is not mentioned under the heading of those diseases, for it is so described in its proper place, and this last section of the book is mainly devoted to operations and to various forms of general treatment. The volume appears to us to be a good one; it will doubtless appeal more to the Germans for whom it has been written than to students in this country.

The Topographical Anatomy of the Limbs of the Horse,[13] by Professor O. CHARNOCK BRADLEY, can, we think, be best described to medical readers as a book comparable in many ways to Cunningham's well known *Manual of Practical Anatomy*. The comparison is made peculiarly close by the fact that the drawings which form so important a feature of the two works are from the pencil of the same gifted artist, Mr. James T. Murray. The description of the parts of the limbs is accompanied by instructions as to their display by dissection. While the book is, of course, primarily intended for students of veterinary anatomy, it will be found, we think, invaluable to any human anatomist at work on the morphology of the bones, muscles, ligaments, or joints of the limbs; it is a book of which many workers on these subjects must often have felt the want. A study of the book, together with the study of human anatomy, will also, we imagine, throw a flood of light on the functions of the various parts and structures making up the limbs as well as on Nature's methods of evoking progressive and retrogressive variation. We feel confident the book will quickly gain the popularity its merits deserve, and that the demand for a similar treatise on the remaining parts of the horse as well as on the anatomy of the other domestic animals will be so insistent that their appearance can only be a matter of time. The work does credit both to the author and to the school with which he is associated.

The Street of Faces: Glimpses of Town,[14] by Mr. CHARLES VINCE, will appeal to readers who love old London and the flavour of Lamb and E. V. Lucas. It is inspired by a whimsical imagination not without a touch of melancholy, and has a keen eye to antiquarian relics, as is shown in the attractive essays on "Street Signs" and the "Garbling Office." The latter is the tragedy of a word, for originally "to garble" meant to purify, and the Garbling Office was set up under the Lord Mayor and City of London to cleanse all imported spices, to grade them, and to seal them; but this official used his purifying office corruptly and garbled to his own illegal profit; hence disputes arose, and in the middle of them John Locke wrote, in his *Essay on Toleration:* "To garble thus the truths of Religion"—apparently the first use in any famous work of this word in its degraded and modern sense. Of these twenty-seven little essays, the thirteenth, which gives its name to the collection, is a fanciful sketch of two rooms in the British Museum, in which the busts of gods, emperors, and heroes form a street of faces with the minds and deeds of the men cut into them. The work is beautifully illustrated and well printed.

[9] *The Control of Parenthood.* Edited by J. Marchant, C.B.E., LL.D. With an introduction by the Bishop of Birmingham. London and New York: G. P. Putnam's Sons. 1920. (Cr. 8vo, pp. 212. 7s. 6d. net.)

[10] *Practical Chemistry: including Simple Volumetric Analysis and Toxicology.* By P. A. Ellis Richards, F.I.C. Third edition. London: Baillière, Tindall, and Cox. 1920. (Cr. 8vo, pp. 157. 5s. net.)

[11] *Electric Ionization.* By A. R. Friel, M.A., M.D.Dub., F.R.C.S.I. Bristol: John Wright and Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent, and Co. 1920. (Demy 8vo, pp. 78; 24 figures. Paper, 6s. net.; cloth, 8s. net.)

[12] *Grundriss der Augenheilkunde für Studierende und praktische Aerzte.* By Professor Dr. A. Brückner and Professor Dr. W. Meisner. Leipzig: G. Thieme. 1920. (Med. 8vo, pp. 657; 126 figures; 1 plate. Unbound, 15s. 5d.; bound, 18s. 6d.)

[13] *The Topographical Anatomy of the Limbs of the Horse.* By O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S. Edinburgh: W. Green and Son, Limited. 1920. (Roy. 8vo, pp. xi + 172; 115 figures. 21s. net.)

[14] *The Street of Faces: Glimpses of Town.* By Charles Vince; with 8 drawings by J. D. M. Harvey. London: Philip Allan and Co. 1920. (Roy. 8vo, pp. 145; 8 illustrations. 15s. net.)

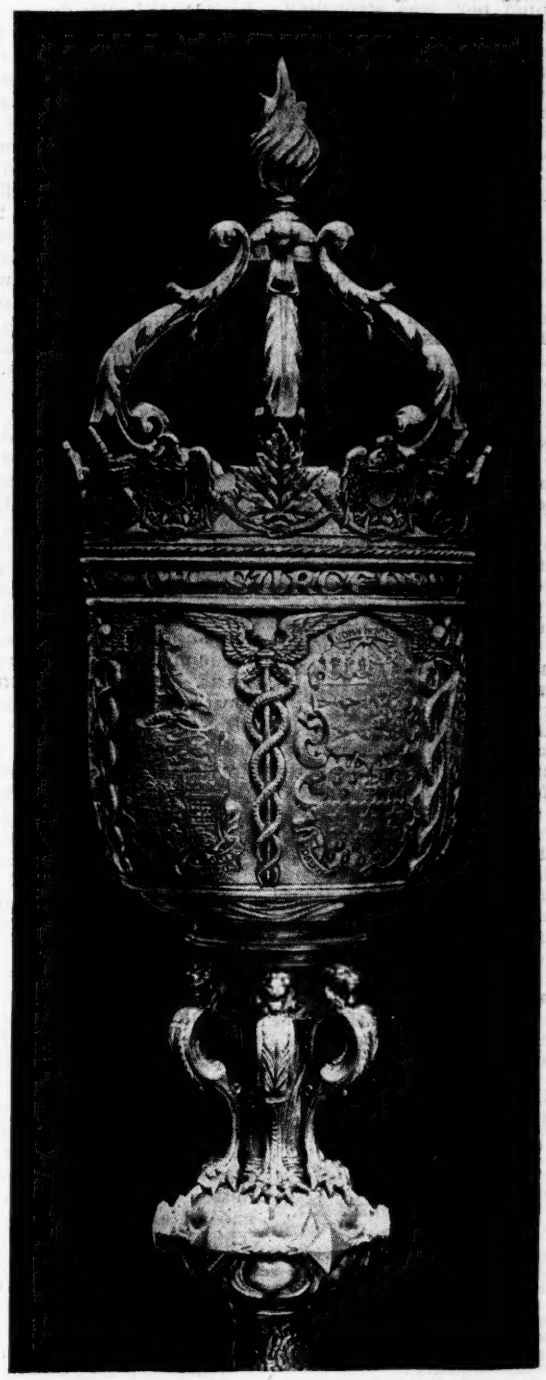
BRITISH AND AMERICAN SURGEONS.

Presentation of Mace to the American College of Surgeons.

Three representatives of the Consulting Surgeons of the British Armies—Sir Berkeley Moynihan, Sir William Taylor of Dublin, and Mr. Albert Carless—have crossed the Atlantic to attend the meeting at Montreal of the American College of Surgeons. They took with them a mace, designed and wrought for the purpose, in order to present it, on October 11th, to the American College of Surgeons, whose president this year is Dr George E. Armstrong, Professor of Surgery and Clinical Surgery in McGill University.

We reproduce below the letter of greeting from Sir Anthony Bowlby, President of the Royal College of Surgeons of England, which was read by Sir Berkeley Moynihan on this occasion, together with a description and photograph of the "Great Mace," and the speech made by Sir Berkeley Moynihan in making the presentation.

It is interesting to remember that Philip Syng Physick described on the head of the mace as the Father of American Surgery, was house-surgeon to John Hunter t the close of the eighteenth century. The first congregation of the American College of Surgeons was held at Chicago on November 12th, 1913, when Sir Rickman Godlee, then President of the Royal College of Surgeons of England, gave an address of congratulation and greeting on behalf of British surgeons.



Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2.
uly, 1920.

Dear Mr. President,

The hospitality which I enjoyed at the meeting of your College in October, 1919, makes me regret all the more deeply that my duties in England prevent me from joining you again this year at Montreal.

The feelings of affectionate regard entertained by British Surgeons have found expression in the creation of the "Great Mace," which has been designed in order to commemorate "our mutual work and good fellowship in the late War," and is a gift from the Consulting Surgeons of the British Armies to the American College of Surgeons.

Much thought has been given to the various emblematic devices which decorate it, and we trust that it may be found worthy of acceptance, and of a place in your College buildings at your annual meetings. The Mace has always been the emblem of "Authority," and, as the American College of Surgeons is now the chief surgical authority on your continent, we hope and believe that our gift is a suitable one. The names of the fifty-four donors will satisfy you that all parts of the British Isles and of the Overseas Dominions are represented, and that Surgeons who served in Italy, in Salonica, in Egypt, and in Palestine have joined with those whose work lay in France and Belgium and at home.

The representatives who have been appointed to convey the Mace to Montreal will assuredly convey to you also the hearty good wishes of all the donors for the continued prosperity of your College, and I can assure you that all of us are animated by the most ardent desire that the good fellowship of the workers in the Great War shall be continued through innumerable years of Peace.

May I ask you to convey to all the Fellows of the College, and especially to my personal friends, my own most cordial good wishes, and may I also offer to you the hope that your Presidential Year will be one of great success in advancing the science and art of surgery.

Yours very truly,
Anthony A. Bowlby.

To the President,
American College of Surgeons.

A Description of the Great Mace Presented to the American College of Surgeons by the Consulting Surgeons of the British Armies.

This Mace has been designed so as to tell in symbolic language of the close union between British and American Surgery, and of the ties which unite Great Britain to Canada and to the United States of America. It retains the traditional shape and proportions of the Civic Mace of the seventeenth century, and is of hand-wrought, chiselled and repoussé silver-gilt. It has been designed and made by Omar Ramsden, who has also embodied some suggestions of the donors.

The Dedicatory Inscription engraved on the plate under the Crown sets forth that it is a gift "From the Consulting Surgeons of the British Armies to the American College of Surgeons, in memory of mutual work and good-fellowship in the Great War, 1914–1918."

The Crown-shaped Finial is formed of six rich scroll buttresses upholding the "Sacred Flame of Science" issuing from a mortar of antique pattern, the model of which was recently found on the Field of Battle near Salonica. These buttresses spring from a cresting composed of alternating Maple Leaves and American Eagles intertwined with the Serpents of Esculapius; while the position usually occupied by a band of jewels in a Monarchical Crown is filled with the words "The American College of Surgeons."

The Body or Head is divided into six panels by the Winged Caduceus; being an ornamental rendering of the badge of the United States Army Medical Corps. The panels set forth the following "Achievements at Arms" in delicate and finely detailed repoussé work:

1st. The full Blazon of the United States of America.
2nd. The Dominion of Canada.
3rd. The Royal College of Surgeons of England.
4th. The Badge of the Royal Army Medical Corps.
5th The Shields of Arms of John Hunter and Lord Lister.
6th. cartouche bearing the words "Philip Syng Physick," 1768-1837, Father of American Surgery.

The lower portion of the Head is decorated with a symbolic band of water indicating the ocean which both unites and separates America and the Mother Country. The latter is symbolized by the British Lion Brackets of highly chiselled work which support the head and terminate the upper part of the staff. The talons of the lion's feet grip the hammered decoration of the upper knop, which consists of a design of American and Canadian Maple seed-pods and heart-shaped spaces. This hammered work is protected by boldly projecting, solid, jewel-like bosses of chiselled work.

The Staff is decorated with a free design of the National floral emblems of the United Kingdom—the Rose, the Thistle, the Shamrock, and the Leek. Intertwined among these are a

number of ribbon scrolls, each one of which bears the name of one of the donors.

The Foot bears, as decoration, the root form from which the above spring, and a series of six small shields which may be used for possible future arms or inscriptions. The extreme bottom knop is fluted with leaves of *Isatis tinctoria*.

The various parts are held together in the traditional manner by a rod of English oak, cut from a tree grown at Witham, Berks. The extreme length is 3 ft. 11½ in., and the weight of silver is 140 oz. troy.

Speech by Sir Berkeley Moynihan.

Three centuries ago, on this very day, a little sailing vessel, leaving England far behind her, was struggling against adverse winds and heavy seas towards America. On board were one hundred pilgrims fleeing from civil and religious tyranny to seek sanctuary and freedom in a new land. No voyage in history has been so fateful. Those who journeyed in that vessel, a chosen company on the horizon of your history, were the best of English stock. They helped to found here a small colony of people, grim and stoical in spirit yet touched with idealism. Though all the great countries of the earth have since given of their best to build your nation, those few pilgrims have left their indelible stamp upon the culture, the institutions, and the laws of this land. Almost a century and a half ago that colony broke away from the mother country, with which it was long at war. But a hundred years of peace between the two nations had been celebrated when, in 1917, they stood together in arms. War is the great revealer. We learnt in that great testing time of our race that ties of blood, when they mean kinship in spirit and an equal surrender to the noblest impulse, are never to be broken. In the Great War America and Britain mingled their blood upon the same stricken field. The hope then grew strong in many hearts that a new understanding, born of comradeship in battle, fiercely tested in the furnace of affliction, and sealed in death, would redeem all ancient blunders, blot out the bitter memories of wrong, and lead at last to a supreme and permanent reconciliation. For we seemed then to realize that deep down in the hearts, enthroned in the conscience of the two peoples, there was the same full eager devotion to eternal principles, love of justice, joy in liberty, hatred of oppression; the same unselfish determination to strive for the redemption of mankind, and to establish anew the freedom of the world. On the fields of Flanders and of France, as in the cabin of the *Mayflower*, humanity recovered its rights.

In the grave and anxious days of war, when we fought so long in fellowship, no associations were closer, no friendships more swift and intimate, no joint labours more fruitful than those of our profession. We then gained each for the other, not respect and sympathy alone, but true affection also. Every lover of his country, every lover of humanity, must wish that the spiritual alliance then created shall endure to the end of time. In our desire to perpetuate the remembrance of those days of duty done together we, the Consultant Surgeons of the Armies of Britain, ask the College of Surgeons of America to accept this Mace. We pray that you may regard it as a symbol of our union in the harsh days of trial; as a pledge of our devotion to the same imperishable ideals; as a witness to our unfaltering and unchanging hope that the members of our profession in the two lands shall be joined in brotherhood for ever in the service of mankind.

The following is the list of Consultant Surgeons who gave the Great Mace to the American College of Surgeons:

Sir Charles Ballance, K.C.M.G., C.B.
Sir Hamilton Ballance, K.B.E., C.B.
Sir Gilbert Barling, Bt., C.B.
Seymour Barling, C.M.G.
Sir Anthony Bowlby, K.C.B., K.C.M.G., K.C.V.O.
Dr. H. A. Bruce
F. Burghard, C.B.
H. Burrows, C.B.E.
A. Carless, C.B.E.
Sir A. Chance, C.B.E.
C. C. Choyce, C.M.G., C.B.E.
Sir Kennedy Dalziel
R. Davies-Colley, C.M.G.
T. P. Dunhill, C.M.G.
Dr. J. M. Elder, C.M.G.
Sir Crisp English, K.C.M.G.
H. A. Fairbank, D.S.O.
C. H. S. Frankau, C.B.E., D.S.O.
Forbes Fraser, C.B.E.
Sir Peter Freyer, K.C.B.
A. Fullerton, C.B., C.M.G.
George Gask, C.M.G., D.S.O.
Sir Henry Gray, K.B.E., C.B.
Sir Robert Jones, K.B.E., C.B.
R. E. Kelly, C.B.
Sir Arbuthnot Lane, Bt., C.B.
Sir William Lister, K.C.M.G.
V. Warren Low, C.B.
Sir George Makins, G.C.M.G., C.B.
Sir Arthur Mayo-Robson, K.B.E., C.B., C.V.O.
A. B. Mitchell, O.B.E.
Sir Berkeley Moynihan, K.C.M.G., C.B.
Sir Thomas Myles, C.B.
T. H. Openshaw, C.B., C.M.G.
Colonel A. Pilcher, C.B., D.S.O.
Owen Richards, C.M.G., D.S.O.
Sir Hugh Rigby, K.C.V.O.
Percy Sargent, C.B., D.S.O.
James Sherren, C.B.E.
Maynard Smith, C.B.
Thomas Sinclair, C.B.
Sir Harold Stiles, K.B.E.
James Swain, C.B., C.B.E.
Sir Charters Symonds, K.B.E., C.B.
Sir William Taylor, K.B.E., C.B.
Sir J. Lynn-Thomas, K.B.E., C.B.
Alexis Thomson, C.M.G.
Sir Wm. Thorburn, K.B.E., C.B.
A. H. Tubby, C.B., C.M.G.
H. Wade, C.M.G., D.S.O.
Sir Cuthbert Wallace, K.C.M.G., C.B.
Sir Charles Gordon Watson, K.B.E., C.M.G.
A. Webb-Johnson, C.B.E., D.S.O.
Sir W. de C. Wheeler.

MEDICINE AT THE END OF THE EIGHTEENTH CENTURY.

Presidential Address to the Medical Society of London.

Sir William Hale-White, who was inducted to the chair of the Medical Society of London on October 11th, drew largely upon the early history of that society for his presidential address on "Then and Now." The society was founded in 1773, and Guy's Hospital Physical Society two years earlier, and from a study of the proceedings of both these bodies during the first twenty-five years after their foundation the new President elicited some interesting facts and conclusions. Our ancestors at this period, he said, were in great earnest in their desire to add to medical knowledge. It was not a day in which there were just a few geniuses abroad, but large numbers of the profession were enthusiastically engaged in learning all that they could. Because, a century ago and more, doctors had not the help of the scientific instruments possessed to-day, there was an inclination to think that they must have been unscientific. Nothing could be more unjust. Sir W. Hale-White read extracts from the early proceedings to show the scientific temper in which problems were approached. The medical men of that day had open minds and were appreciative of the value of evidence. They were aware of the need for discriminating between casual conjunction and necessary connexion. Their debates were prolonged: one on fermentation lasted four and another on animal vitality six consecutive evenings. Cases were recorded with an exactitude and detail that might well be imitated to-day. Our forefathers were trained observers, trained all the more carefully because they had not many instrumental aids, and therefore had to depend to a greater degree upon their senses. From these old memoirs it was evident that they had just as much wisdom as their successors, and from their more scanty data they drew their conclusions quite as carefully. They had as great a desire to advance knowledge, they were as devoted to their profession, they had as keen observation, and although they made mistakes, we were probably making mistakes just as great. It was in treatment that some of their errors were most manifest. Medicine was not for another fifty years after this time to escape from the doctrine that bleeding was almost universally desirable. The amount of blood drawn in those early days was prodigious. Frequently the symptoms of the bleeding were attributed to the symptoms of the original disease, as also were the symptoms resulting from the overdose of a drug—mercury, for instance, in a case of syphilis. The most popular drug at this time was Peruvian bark, which was used not only for malaria, but for many other conditions. It did no harm, and by aiding digestion did some good. Malaria was then rife in many parts of Britain; as its cause was unknown, and it had not been differentiated from many other diseases, and as the benefit of the drug in many cases was dramatic, it was natural to give it in all sorts of disorders. But was not iodide of potassium given almost as loosely to-day? In nervous diseases their mistakes in diagnosis were common; it was not recognized that many symptoms were hysterical which were obviously so, and malingering seemed to go unrecognized. On the other hand, some advice on the treatment of oesophageal stricture by James Johnson in 1787 could hardly be bettered, and there was an admirable discussion on a case of enlarged prostate brought forward by Fothergill. The value of ipecacuanha for dysentery was very widely appreciated. There were several papers also on digitalis, which was employed with great success as a diuretic. The importance of industrial diseases was recognized. Yet all this went on side by side with a certain amount of attention to the phases of the moon in relation to therapeutics.

The four diseases most frequently mentioned during the twenty-five years selected for this review were hydrophobia, tetanus, influenza, and typhus. The profession believed that the best way to deal with hydrophobia was complete excision or the application of strong caustics as soon as possible after the bite. In tetanus enormous quantities of opium were given to relieve the spasms. Influenza came in epidemics; our ancestors made much of the cough. Typhus was extremely common, and one of the most interesting papers in the early journals was a paper by Letttsom, who described the typhus prevailing in Newgate prison.

British Medical Journal.

SATURDAY, OCTOBER 16TH, 1920.

BRITISH AND AMERICAN SURGEONS.

The American College of Surgeons, fellowship of which is not limited to the United States, is meeting in Canada for the first time this week, under the presidency of Dr. George E. Armstrong, Professor of Surgery in McGill University, and the occasion has appropriately been marked by the exchange of international courtesies.

Independence is an idea which has played as relatively great a part in the development of surgery in America as it has in the history of the United States. Independence of thought and action has characterized the surgeons of that country from early days, and they succeeded in inspiring their patients with a determination to face the risks of formidable operations. But there have also been drawbacks, for independence among certain sections of the populace has set up an opposition to medical authority which has led to some strange and erroneous practices. Even more important has been the State view of independence as regards licence to practise; each State has clung to its rights, and it has been impracticable so far to establish a Federal licence to practise throughout the United States.

Among American surgeons in the early part of the eighteenth century was Cadwalader, who had dissected under Cheselden; Philip Syng Physick was a pupil of John Hunter; John Collins Warren studied under Astley Cooper in London, then in Edinburgh and Paris. American surgeons at the beginning of the nineteenth century gave special attention to the arrest of haemorrhage by ligature, and to the ligature of large arteries for the cure of aneurysm. In 1807 Twitchell successfully tied the common carotid for secondary haemorrhage following a bullet wound, an operation not often a success even to-day. Alexander Mott ligatured the innominate artery, and subsequently he removed a large myeloid sarcoma of the clavicle. The operation lasted four hours, and involved the tying of forty vessels; the patient was rewarded for his endurance by a long life. McDowell was in practice in a country district when he undertook his first ovariotomy, about which he could have learnt from John Bell in Edinburgh nothing beyond the pathological anatomy of the cyst. He based his recommendation of the operation to the patient on an analogy with Caesarean section; she rode sixty miles on horseback to be operated on, and was likewise rewarded for her bravery by a long survival after the operation.

Independence and readiness to try fresh expedients on the part of the surgeons, as well as courage on the part of patients, may be further instanced from the history of that great evolution in surgery, the introduction of the practice of general anaesthesia. In the middle of the last century S. D. Gross exerted influence in two directions. By his "Experimental and Critical Inquiry in the Nature and Treatment of Wounds of the Intestines" he started in America the experimental method for the solution of surgical problems; also by his contributions to medical history in his *Lives of Eminent American Physicians and Surgeons*, and the foundation of the American Surgical Association, he extended an interest in medical literature. There followed after the Civil War the founding of the Surgeon-General's Library, and the whole English-speaking medical world has benefited by the publication of the *Catalogue* of the library and of the *Index Medicus* under the direction of J. S. Billings. As great centres of population sprang up in the middle States, surgical activity extended westwa d. At Chicago Senn and Murphy followed Gross, and experimented on animals as to the suitable methods of treating pistol bullet wounds and intestinal obstruction. Murphy imitated in his experiments the various causes of obstruction, and thus transferred to the regular practice of surgery conditions which from the earliest times had been deemed hopelessly incurable.

But whilst surgery made advances in cities, country practitioners lagged behind. They had obtained from their State a licence to practise on easy terms after a superficial education, and continued out of touch with the advances which were being made. Yet owing to the great distances from surgical centres, all urgent cases came perforce under the care of such practitioners. Hence arose a great movement, in which Murphy took a leading part, for the purpose of diffusing surgical knowledge by means of post-graduate courses, periodic travel for study, and the holding of meetings for the demonstration of recent advances in surgical treatment. In order to raise to an adequate standard the surgical practice of all the hospitals throughout the United States, an endeavour was made to link up together those practising surgery. Although Federal recognition may be anticipated in the future, the association of surgeons into a college and the institution of advanced surgical examinations have been started on a purely voluntary basis. The English College of Surgeons and its surgical examinations served as a basis, but variations were introduced. In the conduct of the examinations advantage has been taken of the advice and experience of Mr. F. G. Hallett; and Sir Humphry Rolleston and Mr. H. J. Waring lately reported on their visits to the examinations as now held in the United States.[1] The Inaugural Address to the American College of Surgeons was given seven years ago by Sir Rickman Godlee when President of the English College, and last October Sir Anthony Bowlby gave an address on Surgical Experiences in the War.

The programme for the meeting in Montreal opens with a series of demonstrations at the various hospitals and the delivery of the first oration of the foundation to commemorate Dr. J. B. Murphy of Chicago. Appropriately enough, the first item on the programme concerns acute intestinal obstruction, with Dr. Finney, of Baltimore, as the first speaker. But the American College does not restrict itself to such a great general meeting. During September sectional meetings connected with the Clinical Congress were arranged to be held in the principal towns of such States as Idaho, Oregon, and Montana, and in Washington.

It may be recalled that Murphy presided at the meeting of American surgeons in London just before the war, and he then visited a number of the London hospitals. Now the American surgeons are visiting another centre of British surgery, and an English surgeon, Sir Berkeley Moynihan, has been selected to perform a double duty. The happy association with American surgeons has led the chief surgeons serving in the British Armies during the war to present to the American College a Mace, fashioned on that of the English College, with certain fitting variations, such

[1] British Medical Journal, June 19th, 1920, p. 853.

as may be gathered from the description published at p. 597. The formal presentation of the Mace by Sir Berkeley Moynihan was accompanied by a felicitous speech. The selection of him as the first J. B. Murphy Orator is a compliment to British surgery which the Orator worthily sustained, and he has commemorated one more of the heroes of American surgery by an intimate sketch of Murphy's personality, as well as by a reference to his work as a surgeon.

INDUSTRIAL HOMES FOR CONSUMPTIVES.

Modern methods have succeeded in subduing the activity of many forms of infective disease, but tuberculosis still defies all efforts to check its spread in crowded communities. The reason is not far to seek. The compulsory enforcement of precautionary measures is out of the question, and no adequate means have been adopted voluntarily for dealing with the disease, either in individual cases or in county or municipal areas.

A vast amount of thought, time, and money has been expended upon the provision of various methods of treatment, but, for the most part, only temporary success has been achieved. The consumptive working man who has been rendered fit for work by the judicious regulation of life in the open air or the sanatorium, coupled perhaps with carefully graduated inoculations, must needs return sooner or later to home conditions which preclude the possibility of maintaining the required standard of health. He must, moreover, enter at once into full work in order to earn enough money to live upon, since the hard conditions of most systems of insurance will deprive him of his grant if he undertakes any form of paid work. If his health deteriorates, the arrested tubercle may become active again and he finds himself an invalid as before, a charge upon his immediate relatives or the public and a danger to those living in close association with him. These facts have long since been realized, but it is only of late years that a more rational method has been devised whereby the early consumptive, who is seldom incapacitated from all kinds of work, can be enabled to put in practice all the well-recognized rules of hygiene, associated, if need be, with special methods of treatment, but at the same time to engage in some form of remunerative work.

The idea of segregation on a large scale has often been mooted as a possible means of controlling the spread of the disease, but it has never been brought within the range of practical possibility until the scheme of industrial colonies associated with village settlements or garden cities was devised. Details of the scheme with a full account of its practical working out in Cambridgeshire have recently been made public in a book by Sir German Sims Woodhead and Dr. Varrier-Jones, introduced in an interesting preface by Sir Clifford Allbutt.[1] The object of the colony and village settlement that they have set up at Bourn and Papworth in Cambridgeshire is the provision of treatment for arrest of the disease together with occupation and even remunerative work for the consumptive, while he is still in receipt of grant or pension. The difficulty of finding such work has been to some extent met by the introduction of machinery. An adult patient with physical and mental powers impaired by disease cannot easily adapt himself to a new trade, but he can so adapt himself, as so many thousands of unskilled munition workers have proved, to the control of a machine. If by such means he is enabled to earn a living, he is provided with a cottage in which he can resume home life in the garden city or settlement, so long as he agrees to such restrictions as he knows to be needful for his future well-being.

The details of working, the objections that have been raised and the difficulties that have had to be overcome, together with an account of the results obtained, are duly set forth by the authors. A beginning having been thus successfully made, the promoters look forward to the widespread establishment of garden cities with organized industries in connexion with a central institution, worked by State subsidies through the agency of a Pensions Ministry or the friendly societies. The difficult question of segregation of the actively infective case might, it is thought, incidentally be settled by the establishment of "temperature wards," in which all cases with abnormal temperature would be treated temporarily; the chronic case with persistent temperature would become a permanent inmate, but would not be debarred from some form of remunerative work.

This scheme, which if it is to be successful must be carried out on a very large scale, would seem to offer more of the "hope," to the importance of which Sir Clifford Allbutt refers in his preface, than any other that has yet been suggested. To be successful it must be carried to completion. Permanent and not merely temporary relief, to the patient and the community alike, must be aimed at. It has been abundantly proved that no hard and fast classification of consumptives is practical, and that an infinite amount of care, patience, and tact, founded on large experience, is required in dealing with the many phases of the disease. Hence the need for specially trained medical superintendents able to devote their whole energies to the work. Such men are not easy to find, but the introduction of village settlements must needs be slow, and there is plenty of time for special education in the control of them.

As effective means of checking the spread of tuberculosis, notification and sanatorium treatment—as usually applied at present—have not, it must be admitted, achieved the results which were anticipated by those responsible for their introduction. They have undoubtedly restored a considerable number of individuals to working capacity, but they have not touched the larger question of arrest of the spread of the disease. Something more complete is called for, and local authorities would do well to consider carefully the prospect that is held out to them by the manifest success of the experiment in Cambridgeshire.

[1] *Industrial Colonies and Village Settlements for the Consumptive.* By Sir German Woodhead, K.B.E., M.D., LL.D., and P. C. Varrier-Jones, M.A., M.R.C.S., L.R.C.P. With preface by Sir Clifford Allbutt, K.C.B., M.D., LL.D., D.Sc., F.R.C.P., F.R.S. London: Cambridge University Press; and of all booksellers. 1920. (Demy 8vo, pp. xii+152. Paper covers, 9s. net; cloth, 10s. 6d. net.)

UNIVERSITIES AND STATE GRANTS.

The annual parliamentary grants to universities for this year was fixed at one million, and an extra half-million was granted to help the universities and university colleges to reinstate their machinery after the war. The Chancellor of the Exchequer, speaking at Birmingham on October 8th, said that it was the intention in future to grant £1,500,000 a year, and it was also hoped to do something by way of a special non-recurring grant to enable the federated universities scheme of pensions to be adapted to the cases of older professors and teachers who had served before the pensions scheme came into existence. The grants, he said, would be administered through the University Grants Committee, which was guided by certain regulations. In the first place a university

would not be encouraged to undertake any new development until it had made adequate provision for the subjects it had already engaged to teach and had paid its existing staffs adequate salaries. A second condition was that the grant must not be given for secondary or technical work unless it was clearly established to be work of a university standard. Thirdly, the committee was directed to take into account the amount of local support; if a locality did not give its university adequate local support it could not reasonably expect the taxpayer at large to help it. A promise had been made by the Prime Minister that a grant of pound for pound would be made in respect of any money raised in aid of the University of Wales; the condition was that a penny rate should be raised throughout the whole of the Principality; if other localities did the same for their universities they would have a similar claim. The same principle would apply to the University of London. The question of the proposed new site in Bloomsbury seems to have advanced during the last ten days. The original offer of the Government, as made public by the Minister of Education in May, was to give a site which would eventually amount to eleven and a half acres, and to provide for the maintenance of the buildings but not for the cost of their erection. In return the University would give up its offices at the Imperial Institute, South Kensington, and King's College would resign its site in the Strand, which it holds at a peppercorn rent from the Crown. Mr. Fisher has now addressed a letter to the Vice-Chancellor of the University, which seems materially to alter the situation. After denying that the balance of gain, after the exchanges above-mentioned are carried out, rests with the Treasury, and after noting that the annual charge for maintenance of the new and more spacious head quarters will be larger than that in respect of the present offices at South Kensington, he said that if the University Grants Committee were to recommend that a grant spread over several years should be made towards the building of the new university head quarters there would be no difficulty with the Treasury in making arrangements for the payment of such a grant in instalments as might actually be required for the erection of buildings. The grant, he added, would be made contingent upon the amount of support the university could obtain from municipal or private sources. Mr. Fisher estimated that the total grant from the Treasury to the University of London, its colleges and schools, for the academic year 1920–21 amounts to £244,000, an advance of more than £200,000 on the grants paid to the same institution in 1899. In addition, a non-recurrent grant of £141,000 was made in respect of the academic year 1919–20. In view of these facts Mr. Fisher thinks that the University need not fear that the Government will be unsympathetic in considering its further needs. It has not, we believe, hitherto generally been understood that the University Grants Committee was competent to recommend the Government to make a grant towards the building and equipment of the future head quarters of the University, but, as this is so, it is not surprising to hear that the Sites Committee has recommended the Senate to accept the offer of the site in Bloomsbury.

SICK WASTAGE IN WAR.

A VALUABLE article on sick wastage appears in the August number of the *Journal of the Royal Army Medical Corps*, by Colonel A. B. Soltau, A.M.S.(T.F.), who (it is an open secret) did a great deal to focus attention on the enormous importance of the wastage of men from medical causes, as opposed to that from battle casualties, in the latter part of the war. The author gives statistics of the sick admissions to casualty clearing stations for one year (1917) in one of the armies. From an analysis of the figures he finds that no fewer than 25 per cent. of the cases originated from scabies or some form of pyodermia similarly preventable by careful inspection and personal cleanliness, and that nearly 20 per cent. were due, directly or indirectly, to trench fever—a disease similarly, of course, preventable. The evolution of laundries, first started in the field ambulances and eventually taken over by the Armies, the provision on the large scale of baths and disinfestation stations, went a long way latterly towards the suppression of these dirt diseases. A great number of patients who went to form the floating hospital population were men suffering from slight disabilities, who had been enlisted in error by medical boards in England, for disabilities which in civil life do not prevent a man from being a wage-earner but are bars to efficiency on active service once the psychological stimulus of enthusiasm has worn off. Standing medical boards at the bases, as established in the Egyptian Expeditionary Force, composed of men experienced in the needs of the front line, would appear to be essential. Venereal disease as another cause of wastage ought also to be included among the preventable diseases, if instruction by medical officers were thoroughly carried out. According to Colonel Soltau's statistics, therefore, the majority of medical admissions to hospital—excluding certain diseases which at times were epidemic, such as influenza in 1918 and nephritis in 1915 and 1916—were from preventable disease. In regard to the treatment of the sick, the experiment carried out in the Fourth Army during the winter of 1917–1918, of establishing convalescent centres in the Corps areas, was very successful in preventing wastage. As we have often remarked, the evolution of the casualty clearing stations—from being actually rail-head clearing stations to becoming the vital centres of surgical and medical activity, better equipped than many base hospitals—was one of the most striking developments of the war. Every stage, however, of evacuation of the sick man, from casualty clearing station to base, from base to England, meant greater delay in return to duty—far greater once the man was sent to England, where a state of "hospitalization" was easily acquired and extremely difficult to overcome. For this reason, and also because a man could be sent back to his own unit, where he was at once more efficient and more contented than in a strange unit, the completion of treatment of the sick in the forward areas—latterly not much less quiet and safe than the base—was found to give excellent results. Colonel Soltau's article, which appears to be the first attempt to show the wastage that sickness caused in France, is all the more useful in that it so clearly indicates how the failures in the past might be obviated.

CONFERENCE ON CAUSES OF DEATH.

AN international conference, organized by M. Jacques Bertillon, is being held in Paris this week to assist in the decennial revision of the International List of Causes of Death. The delegates nominated by the British Government to represent the United Kingdom are Dr. G. S. Buchanan, Senior Medical Officer of the Ministry of Health, Sir Humphry Rolleston, Dr. T. H. C. Stevenson, Superintendent of Statistics, General Register Office, Dr. J. C. Dunlop, Superintendent of Statistics for Scotland, and Dr. N. M. Falkiner, Medical Superintendent of Statistics for Ireland. The conference was opened on October 11th by M. Breton, the French Minister of Health; it is the third of the series. The preceding conference, that of 1909, which was attended in strength by delegates of the United States but not by British delegates, issued the present International List. This the British Registrars-General adopted in common with the greater part of the civilized world. The English *Manual of the International List of Causes of Death* and the "short list" used by medical officers of health are both based upon the International List; the British "short list" is very similar to the condensation used in the United States. In this way comparison of British mortality with that of other countries has been greatly facilitated. Before leaving for Paris the British delegates conferred at the Ministry of Health with

representatives of various authorities interested in the nomenclature of disease, such as the Navy, Army, and Air Force, the Royal Colleges, the London County Council, the Medical Research Council, and the Society of Medical Officers of Health. They have also received and considered detailed criticisms upon certain proposed amendments from the same representatives.

COMMON SENSE IN SITE PLANNING.

A BRIEF reference in a recent issue to the economy of putting fireplaces and flues on inside walls has led Dr. Lionel Picton to send us a pastoral photograph, showing a sheep-dog and a lamb warming themselves against the outside wall at the back of the kitchen fire. The picture may serve to impress on the public mind the loss of heat from a fireplace built against an outside wall; it is used to illustrate the report on housing issued by Dr. Picton, who two years ago succeeded Dr. Garstang as M.O.H. for Winsford, a growing town in the salt district of Cheshire. The report deals with the special conditions of a particular site, but the problem is looked at freshly, and many of its shrewd common-sense observations are of general application. The present cry for better housing, Dr. Picton thinks—and we hope he is right—is a genuine demand for the abandonment of what may be described as the Victorian standard of urban dwelling, which consisted of row upon row of wedge-shaped buildings, with slatternly back-yards dovetailed between the narrow part of the wedges. Dr. Picton would lay out a site without regard to preconceived conventions. In his conception aspect is the essential point; for this reason he thinks the lay-out should not be determined by existing road frontages, but the houses so placed on the site that the chief living rooms are to the south. Though he shows a parlour he does not fear to say that the architect should remember that the kitchen is the chief living room of the house, and for the woman it and the scullery the chief working rooms. The kitchen should have a wide window to the south and a stove on an inside wall. The arrangement of the scullery is a special feature of his plan; it opens on to a southern porch and the two together occupy the whole depth of the house. The scullery is separated from the porch by an ingenious but simple double door, which can be opened one-third, two-thirds, or altogether. Dr. Picton estimates that the scullery might be widely open to the porch for two hundred days a year, so that the woman of the house may, if she chooses, work practically in the open air. Further, a window is shown looking from the kitchen into the porch, so that the mother, if working in the kitchen, can keep an eye on an infant in the porch. Four bedrooms are shown upstairs, one of them opening by a French window on to a balcony. The cottage he describes measures 33 ft. by 20 ft., and would form a suitable dwelling for an artisan with a young family. The house stands back towards the north of its site, and the living rooms look over the garden to the south. Groups of houses are reached by drives leading from the main road. These drives need not be heavily metalled, curbed, and channelled; instead of flagged sidewalks there may be grass verges and gravel paths, and useless dwarfed walls and iron railings could be replaced by hedges. After careful calculation the Committee on Housing, presided over by Sir John Tudor Walters, concluded that a lay-out of this open type, though using more land, was less costly than closely packed, heavily paved slums. Nevertheless, the plans of the housing department of the Ministry of Health do not seem to contemplate the possibility of detached houses; it appears to be assumed that they will be semi-detached or in blocks of four, pierced by a bricked passage through the middle pair, which, as Dr. Picton says, indicates a relapse to the evil tradition which the present movement towards better housing should do away with. Convenience is subordinated to symmetry, and to a narrow margin of cheapness. The new houses in rows will not provide those inestimable benefits of air and light which the same land, and almost the same materials and workmanship, would confer if employed in the more open type of development.

LUNACY IN 1919.

THE sixth annual report of the Board of Control for the year 1919[1] states that on January 1st, 1920, the number of notified insane persons under care in England and Wales was 116,764, an increase of 61 as compared with the number on January 1st, 1919. This is contrasted with decreases of 3,278, 3,159, 8,188, and 9,138 for the years 1915–18 respectively, and with an average annual increase of 2,251 for the ten years immediately preceding the war. In previous reports attention had been directed to the consistent increase in the numbers of patients under care occurring yearly from 1859 to 1914, and in the last report the opinion was expressed that the decreases of the years 1915–18 were of a temporary character, and related to the exceptional social and economic conditions arising from the war. A return to more normal conditions during 1919 has coincided with the first increase in numbers for any year since 1914, although the marked change from a decrease of 9,138 (in 1918) to an increase of 61 (in 1919) has been caused not so much by an increase in the number of patients admitted as by a decrease in the number of deaths in institutions, which were 7,446, or 39 per cent. less in 1919 than in 1918. The economic conditions due to the war, which affected the general health of the community, were felt with exceptional severity in institutions, and especially in the asylums, of this country. A rising death rate, culminating in the last year of the war, was marked by an exceptional mortality from dysentery and tuberculosis—preventable diseases which have always been prevalent in asylums, and to which the insane would seem to be markedly prone. It is gratifying, therefore, to find that in 1919, with the abnormal war conditions gradually disappearing, the asylum death rate has so remarkably improved. A fact that has a bearing on the increase of male patients under care is that there were some 1,600 mental and nervous cases in military hospitals on January 1st, 1920, about 2,000 less than a year previously, and of these 2,000 a considerable proportion were during the year certified and admitted to civil institutions. The report includes the circular letter issued to visiting committees by the Board of Control, already fully noted in the JOURNAL of September 4th last (the Educational Number). This gave suggestions for improving the status and prospects of assistant medical officers in the asylums service (an object for which the British Medical Association and the Medico-Psychological Association have long been working together and separately); for providing more effective treatment of recoverable cases upon modern lines; and for raising the standard of instruction of assistant medical officers in asylum practice, both now and in the future.

CANNED FOOD.

WE have received from the Food Investigation Board an interesting report,[2] by Dr. William G. Savage, on the methods used for the inspection of canned foods and their trustworthiness for this purpose. In view of the extent and the value of the trade in canned foods and of their widespread popular use the report raises points of great importance. The trade examiners are impartial, and there is no inducement for them to be otherwise, as the large retailers to whom the cases are sent are well acquainted with the signs of defective tins and will certainly throw them out, erring if anything on the side of an undue stringency, since the local retailer will not accept any tin with the slightest sign of defect.

[1] H.M. Stationery Office, 1920, 1s. net.
[2] Food Investigation Board, Special Report No. 3: Part I, Canned Meats. H.M. Stationery Office, price 9d. net.

To a doctor the methods employed by the wharfinger examiners are particularly interesting, for they strikingly resemble those employed by him in the physical examination of the human chest. A full examination of the unopened tin comprises inspection, palpation, percussion, and sometimes shaking, a form of auscultation. In practice, apart from obviously blown or otherwise obtrusively unsound tins, reliance is placed mainly upon percussion—that is, the character of the sound yielded by tapping the surface of the tin by the fingers or by a piece of wood. As there is a considerable vacuum normally inside the tin after the process of sealing and cooling, the pressure of the outside atmosphere ensures that the meat is in contact with the tin all over; on percussion, therefore, a sound tin emits a dull note, but if the meat is not in contact there is air or other form of gas and the note is tympanitic. It is satisfactory to find that the investigations of Dr. Savage show that there is the smallest possible chance of unwholesome canned food getting as far as the ordinary retail markets.

THE PRINCE IN AUSTRALIA.

The home-coming of the Prince of Wales this week makes it appropriate to refer to a letter we have received from Lieut.-Colonel Leonard W. Bickle, A.A.M.C., describing the arch of welcome erected by the New South Wales Branch of the British Medical Association in honour of the Prince's arrival in Sydney. Colonel Bickle's letter is accompanied by a photograph of the arch taken by himself, but this, unfortunately, does not lend itself to reproduction in our columns. The picture shows us a rectangular archway, with massive columns, each some 24 ft. high and topped with a flagstaff bearing a standard. The slender cross-piece is inscribed "Welcome to H.R.H. the Prince." The whole design is severely simple, and for that reason all the more effective. Through the arch we see the long vista of College Street flanked by decorative masts, with the Sydney Museum on the left of the picture. In the far distance is another arch—the citizens' arch; many others were set up by public bodies at different parts of the route taken by the procession. Our correspondent expresses regret that the marks on the arch erected by the New South Wales Branch were not distinctive enough to allow of the general public at once recognizing by whom it was put up. We are therefore the more pleased to have some record of our colleagues' loyal tribute to the Prince.

LIVERPOOL TUBERCULOSIS CONFERENCE.

The eighth annual conference of the National Association for the Prevention of Tuberculosis was held last week in Liverpool, and was attended by nearly 1,000 delegates, representing all parts of the United Kingdom.

At the opening session, over which Sir Arthur Stanley presided, there was a discussion as to the value of the methods of prevention and treatment now in vogue. This discussion tended to centre on the sanatorium, and while the majority of clinicians who spoke were agreed as to the excellent results of this treatment in suitable cases, a fresh issue was raised by the suggestion that advanced cases should be admitted to sanatoriums. Dr. E. W. Hope (M.O.H. for Liverpool), whose paper was read by Dr. Mussen, expressed the view that sanatoriums had been introduced with an unfortunate flourish of trumpets, which resulted in inflated expectations amongst those who did not appreciate the precise functions of a sanatorium, while the extravagant claims which the more ardent supporters of sanatoriums put forward gave the general public the impression that admission to a sanatorium was equivalent to restoration to health, exclusion from it a sentence of death. It must be asserted with absolute confidence that institutions for the reception of patients at all stages were essential, but that the exclusive selection of cases with a view to good sanatorium statistics, and the limitation of institutional care to these, was preposterous. Mr. T. White, who later supported this view, said that in Liverpool they had opened wards for advanced cases, but that as soon as this was known the patients refused to go. If the advanced case was willing to go to a sanatorium it would be inhuman to refuse him. Dr. Nathan Raw held that the unsatisfactory results of treatment at the present time were due almost entirely to the fact that sufficient time could not be devoted by the patient to his cure. Dr. Ian Struthers Stewart said that factors which militated against the success of sanatoriums were that individual doctors had charge of too many cases, and also the failure to diagnose many cases until the disease was in a late stage. The medical profession must bear a part of the blame, as a large proportion of cases were not recognized until the disease was advanced. Dr. Halliday Sutherland considered an average of three months' sanatorium treatment was nonsensical. If advanced cases were admitted to sanatoriums and died there, the only result would be that these institutions would get a bad name, and that the early curable cases would refuse to go. That was already happening. The sanatorium and the hospital were interdependent elements in a co-ordinated scheme. Dr. Charles L. Minor said that in America they had already tried and abandoned the practice of lumping all stages of the disease in one institution. When patients refused to go to an institution there was something wrong with the institution. With all respect he urged the reform of British institutions for advanced cases. Each ward should be a little family of twenty-five persons, each of whom was intimately known to the doctor.

Lord Glenconner presided over the second session, when the subject for discussion was "Practical difficulties in connexion with the carrying out of tuberculosis schemes and the best measures to overcome them." Dr. J. G. Adami, Vice-Chancellor of Liverpool University, said that some of the difficulties of domiciliary treatment might be overcome by adopting a modification of the "class method" introduced by Dr. Joseph Pratt of Boston. Classes were established in association with churches, the congregations providing funds with which to make a start and to appoint a specially trained social worker. Suitable cases for the class were those still in the curable stage. Patients spent the entire twenty-four hours in the open, on the roof or verandah of their house, which they only entered for meals and ablutions. That was easier to do in Canada than here. Tents, blankets, and reclining chairs were supplied by the congregations. On the average those patients living in Montreal streets gained twice as much as patients sent to a sanatorium seventy miles away. The cause of this difference was certainly psychological. Sir Henry Gauvain entered a strong plea for better instruction on tuberculosis in medical schools. The medical practitioner represented the first line of attack in the fight. It was imperative, if real and speedy progress were to be made, that thorough and systematic instruction in all forms of tuberculous disease should be given in the medical schools and facilities provided for extramural knowledge to be obtained. Dr. Alexander Sandison advocated a co-ordinated and systematized scheme for keeping clinical records of all cases of tuberculosis.

Sir Robert Philip presided over the final session, at which Dr. A. W. J. MacFadden opened a discussion on tuberculous milk. He urged that measures to protect the community from dangers arising through milk should be combined with an active policy for increasing the consumption of milk in order that the dairy industry might attain its maximum commercial efficiency. Professor J. M. Beattie discussed the various methods of ensuring a pure milk supply. In regard to the campaign for clean milk, he remarked that clean milk might be tuberculous milk. Sir Robert Jones condemned the use of artificial milks. The photographs of children fed on such milks looked very impressive, but there were marks about the wrists and heads of these children which any surgeon could recognize as characteristic of rickets. Dr. Stenhouse Williams drew attention to the practical needs of the dairy farming industry.

Before the conference ended the following resolution was carried unanimously:

> This Conference views with satisfaction the growing interest which is being shown throughout the country in relation to the prevention of tuberculosis. It reaffirms its belief that the methods adopted are justified by the results obtained, and urges their still more vigorous prosecution. In particular the Conference urges the Government to consider the immediate institution of a more definite system of medical inspection in the case of certain industries where tuberculosis is especially rife. It also urges that the Milk and Dairies Order, 1915, and the Tuberculosis Order, 1914, should be brought into operation with as little delay as possible.

MOTOR NOTES FOR MEDICAL MEN.

BY H. MASSAC BUIST.

FUEL PRICES.

NOTHING could better illustrate the chaotic conditions of to-day than the situation in regard to motor fuel. A month ago there was every prospect that the world would have to pay more and yet more for its petrol and benzol. Yet this week threepence a gallon has been taken off the price of petrol in this country. Some vendors are actually forecasting that, when the sixpence a gallon duty comes off at the end of the year, it will be found that the price of fuel will be reduced to the public by that amount. Seemingly the financial situation in Europe and America will help towards the attainment of this. It would, however, be unwise to build too many hopes on this, for we have seen the situation completely reversed in the last four weeks; consequently there may be a reversal, in an unfavourable direction to the consumer, in three months. Many explanations have been or may be given as to the cause of this present change in the prices of motor fuel. One thing is certain, it proves once more that at present the price of motor fuel is controlled by America. The chief cause of the fall is that the United States groups are willing to sell it cheaper. The reason is that the United States are now passing through a period of extreme depression, which has had an immediate effect in reducing the home demand for new motor vehicles. Of course, the prices of motor fuels are fixed by the big corporations, on the result of calculations made on prospective, as well as on present demands. In the ordinary course prospective demands include the increasing rate with which new motor vehicles are acquired and put into service by the public, therefore a check to the absorption of new cars or utility motor vehicles by the public at once reduces the estimates of consumption in the near future: hence the controllers of motor fuel look for other markets.

In doing so their attention turns first to Europe. In France there has been a brief period of rapidly changing prices, practically always in an upward direction; while these prices obtained, the full force of the industrial depression came over France, with a result that there has been a great check in the prospects of motoring, particularly in the case of utility vehicles. Consequently France has accumulated a very satisfactory supply of motor fuel; indeed, she has probably never been better off in this respect than she is to-day. But demand rather tends to decrease than increase, for Frenchmen, like other taxpayers, have to curtail their expenditure. Therefore the price of motor fuel in France during the last few weeks has come down steadily.

Germany has also been faced lately with the fact that she has not as much petrol as she presumed she could use, by two-thirds at least. To-day she can get at a price all she wants from America, but she cannot afford to export money in exchange for petrol. Therefore the German Government is standardizing two classes of motor fuel. One is a combination of benzol and petrol; the other is a combination of alcohol and benzol. She can rely on both these home-produced alternative fuels because her coal miners are to be depended on as well as her agriculturists. Moreover, her enterprise in this direction is likely to be of considerable importance to motor users throughout the world in the future, in that we are not really getting anywhere fuels of the sort we used to have before the war, but are instead gradually increasing the proportion available from the treatment of raw materials by ingenious mixtures. We are merely at the beginning of the phase. Of course Germany will be of assistance to us in this direction merely in measure as we require knowledge of the various processes she evolves. She will not be an exporter of fuel. It will merely be for us to study the application of her methods to our own case. In this country, too, consumption is not increasing at the rate anticipated.

ECONOMIZING FUEL.

The Royal Automobile Club was on the point of promoting a series of trials of accessory devices to economize motor fuel consumption when the announcement was made of the fall in petrol prices. Precisely what will be the effect of this on the scheme has not been decided; but it is likely that there will be no trial of these devices if the price of fuel tends rather to fall than to rise. In the interests of medical men it is possible only to repeat the advice given here long ago, to the effect that it is not wise to lock up the sums of money necessary to acquire these devices unless the one selected has been submitted to an official test of some sort. The reason is obvious. Every time any increase of costs is manifest in connexion with motoring, inventors see a chance of reaping a golden harvest by causing the public to buy devices before there has been furnished any official proof of the ability of the given invention to justify its claim in practice. Anybody marketing a genuine device need not wait for the Royal Automobile Club to suggest a trial of it, for that organization is always able to undertake individual tests of devices for very moderate fees—that is to say, for practically the bare costs. Provided the invention is a genuine one the certificate issued to the public has an enormous advertising value to those marketing the device. Therefore it is practically inconceivable that anybody with an invention that can really revolutionize the fuel situation by effecting economy would abstain from such an obvious cheap and simple form of enterprise as getting it tested officially. It takes several extra pence per gallon off petrol over a long period to recover, say, £10 10s. spent on acquiring a fuel economizer *plus* the cost of fitting it.

In the meantime it may be noted that practically none of these devices are standardized. There is, however, at least one exception, for quite twelve months past a number of cars, both in the Old World and in the New, have been standardized with the "autovac" system of fuel feed between the petrol tank and the carburetter. Undoubtedly this principle does save fuel and make for more satisfactory working, particularly in the case of machines that have a pressure tank. For all its disadvantages that method is coming increasingly into use owing to the need to redistribute the weight on the chassis in face of mechanical engine-starting devices, and so forth, all increasing the load on the forepart of the vehicle. Therefore, for weight distribution it is better to place the tank at the extreme rear of the chassis instead of at the dash. The autovac system is excellent both for pressure and for gravity fed systems.

For the rest, the best hints that can be given to the medical man for saving petrol are to remember such obvious things as to test, at frequent intervals, the alignment of the wheels of his car. It is astonishing what a number of folk drive their cars with the wheels slightly out of alignment, with a result that the tyres get ground away and there is a great loss of effort, or, in other words, a considerable proportion of extra fuel consumption. Again, especially in the event of cold weather, one should always assist the warming up of the engine by leaving a rug, or some sort of a cover, over the radiator until the engine has got thoroughly hot. In the case of medical men, when a call is made something should be thrown over the cooler. Two or three miles more to the gallon can be obtained by doing this, apart from the convenience of easier restarting and the gain of better performances as judged by pulling power. Another point to remember when driving a car is that when it has attained the desired speed it is wasteful to keep the accelerator pedal in the position by which that speed was got. Instead, the proper way to drive is to employ the accelerator mostly to attain the desired speed; it should then be released gradually to such a position as enables the given speed to be maintained. That is the most economical way. Another thing very common among drivers is that they "burn too much petrol and too little spark," as the saying goes. On those cars wherein the driver has control of the ignition point, the tendency is to leave the lever more or less in one position, or to employ two positions at most, one for starting and the other for running. Economy, as well as a much better performance, can be achieved by remembering that in the hands of a driver who develops a real sense of feeling for the business the spark control is capable of variation to no less an extent than is the throttle. In the ordinary way, at twenty to twenty-five miles an hour a car ought to take the fullest advance of the ignition. In measure as the spark is retarded the fuel burned is wasted. The spark ought to be varied just short of pinking, which should never be allowed.

Medical men will doubtless be interested to know that the second post-war Motor Car Exhibition will be opened

at Olympia, Kensington, and at the White City, under the patronage of the King, from November 5th to 13th. This will be the first occasion on which the British show has taken the place of the French one. It will be the most representative show of the kind ever held, the exhibitors being more numerous than ever before. Nothing that has been done in America is in any wise comparable as regards representing the international element. Last year the outstanding feature was furnished by the number of high-powered expensive cars staged. This year the middle and small sized cars will constitute the principal features of the display.

FACTORIES AND WORKSHOPS IN 1919.

THE annual report of the Chief Inspector of Factories and Workshops for the year 1919 has just been published.[1] It appears in a new form, in chapters, each dealing with one important subject and containing a summary of the detailed reports of the inspectors.

It has been found that during the war the standard of safety and sanitation on the whole declined owing to pressure of work, shortage of staffs, and difficulties in obtaining materials and labour to effect repairs or renewals; but during 1919 a great step forward was made not only in recovering the lost ground but in many cases in advancing to a much higher standard. The higher level of sanitation and comfort required in munition and other war material producing works, and the strict conditions attached to emergency orders have tended to produce better surroundings in general and greater regard for cleanliness in particular, in certain classes of factories.

It is surprising to learn that on the part of the workers themselves there is no great demand for washing and sanitary conveniences, even where the trade is obviously dirty and unpleasant, and also that firms that are leading the way in welfare work have unsatisfactory sanitary conveniences. One firm which had a continuation school, a dental clinic, and a welfare staff, had sanitary accommodation which the report describes as "extraordinarily bad." Conditions of this kind, however, are bound still to be found, when the general standard of domestic sanitation is still so low in many parts of the country, both urban and rural, and where it appears to be difficult for the factory inspectors to persuade the local authorities that anything better is necessary or desirable. The same difficulty has been found in the provision of drinking water in factories, under the Order of October 9th, 1917, which routine enforcement during 1919 has now made well known. Under pressure from the factory inspectors to provide "wholesome" drinking water, firms in certain country districts have found it necessary to stir up the local authority, with the result that it is hoped that a more efficient service for the whole district will be provided.

The whole question of heating, especially in large factories such as engineering shops, appears to be receiving much attention, and in nearly every district the unit system of heating is being introduced. In this system each unit consists of a bar which forces the air under pressure downwards over steam-heated pipes and so distributes the heated air at floor level where the effect is most felt by the workers. In order to obviate the "dry" feeling in the air, sometimes noted in shops heated by this system, one firm has introduced a slight amount of steam from jets near the roof, and the workers maintain that the atmosphere is improved. Another interesting development for reducing the very high temperature associated with many important industries is the douche system of air cooling, in which a douche of cool moving air is blown by means of fans into the space where the men are at work, producing a cooling and refreshing effect. Employers and workers both speak enthusiastically of it, and whereas in former years the men often left work in the early afternoon owing to the excessive temperature they were now able to put in full time without fatigue. The close relationship between production and good working conditions is thus demonstrated.

In regard to industrial diseases the Whitley Councils made themselves felt during the year, and conferences were held with representatives of the manufacturers and operatives in different trades to consider possible improvements in matters affecting health. The statistics show that in lead poisoning there has been an increase as compared with the phenomenally low figures for 1918, but that was unavoidable with the return to ordinary trade. The industry which now stands out as the one exposing workers to the greatest risk of plumbism is not that of the manufacture of white lead, pottery, or coach painting, but the manufacture of electric accumulators. Experiments have in the past been made in this country in the direction of accomplishing by machinery the operation of pasting in this industry—in which the larger proportion of cases occur—but they have not been so successful as in America, where pasting machines are beginning to take the place of hand-pasting in the larger works. Among the few cases of plumbism reported in the pottery industry the proportion of fatalities is very high—28.1 per cent. over the five years 1915-1919, compared with the proportion—7.2 per cent.—to all reported cases.

The Anthrax Disinfection Committee was appointed in 1919 to advise the Home Office on the scheme for disinfecting infected materials. With the formation of this Committee the Anthrax Investigation Board of Bradford, feeling that the object was accomplished for which it was appointed fourteen years ago, has dissolved. The success of the work of this Board is a signal instance of a branch of a large industry attacking the particular problem in a scientific manner and in the right spirit. They consider that clinical experience has shown that a fatal termination in anthrax is now a rare event, provided the necessary medical attention be available and the disease recognized at an early stage. This may be due to the efficiency of the serum treatment of anthrax combined with enforcement of physiological rest, the need for which, they say, has been well established; while grave doubts have been cast on the utility of the excision of external anthrax, save perhaps in the earliest stages.

During the year considerable progress was made in complying with the first aid clauses of the Welfare Orders, and three inspectors have been entirely engaged during the year in their administration. With the routine keeping of records of all slight accidents requiring first aid, attention has been focussed on their causation, and surprise has been expressed by more than one management at the number that occurred, very few of them being reportable under the Notice of Accidents Act. Workpeople and employers alike appreciate the advantages of the new regulations, and find the first aid rooms of great benefit to the works from both points of view.

[1] Cmd. 911, H.M. Stationery Office; price 1s. 6d. net.

EXPERIENCES OF PROPHYLACTIC VACCINATION AGAINST INFLUENZA.

Two methods may be used in an endeavour to estimate the efficacy of prophylactic vaccination against influenza. According to the first mode, the incidence and the mortality rate of influenzal infection, simple or complicated by pneumonia, are measured among the inoculated and the uninoculated; the alternative is the retrospective method of ascertaining what proportions of patients undergoing attacks of influenza have received prophylactic inoculation, regard being had also to the comparative mortality among the uninoculated, the partially inoculated, and the completely inoculated.

During the influenza epidemic in New South Wales—of which we gave an account on September 25th, 1920—prophylactic vaccination was employed on a very large scale. Public dépôts for vaccination were opened two months before the occurrence of the first case, and prophylactic inoculation became exceedingly popular, partly, it is said, in consequence of a widely spread belief in its efficacy as a remedy for rheumatoid arthritis and chronic catarrhs. For some weeks the practitioners in the towns were kept busy in inoculating their patients; most of the large business firms made private arrangements for the inoculation of their staffs, and in the public dépôts the number of inoculations, according to a conservative estimate, was 670,000. Almost a quarter of the whole population of the State received this treatment. In this epidemic it was not possible, by a process of "following up," to compare the mortality among those who had and those who had not received prophylatic vaccination. By retrospective investigations, however, it was found that of 12,000 persons treated in public hospitals, the mortality among 6,249 persons who had not been inoculated was 16.5 per cent.; among 705 persons who had been inoculated once, 11.1 per cent.; among 2,273 persons who had been inoculated twice, 10.1 per cent.; and among 605 persons who had been inoculated three times or more, 8.2 per cent.

In the Studies on Epidemic Influenza issued by the University of Pittsburgh School of Medicine, Dr. Samuel R. Haythorn gives an account of vaccine prophylaxis

against influenza as employed during the epidemic in Pittsburgh. At the commencement of this epidemic articles on preventive vaccination began to appear in the daily papers, and several large industrial companies offered free vaccination to their employees and their employees' families. As a consequence, "physicians' offices were besieged by persons who either demanded vaccination at once," or wished to be advised regarding its efficacy. The call for vaccine soon exceeded the supply, and the Medical Society felt it necessary to issue a public notice giving warning that no vaccination, serum, or inoculation would guarantee immunity against influenza; as the result the public demand for inoculation became considerably diminished. Dr. Haythorn points out that comparisons of the incidence and mortality among the uninoculated and inoculated are most valuable when vaccination has been completed before the epidemic has reached the field of observation. The only instance in which in the Pittsburgh epidemic such a comparison was possible was that of a hospital having a population of about 1,000 patients and 300 employees; a mixed vaccine was given about three weeks before the appearance of the first case. Among the unvaccinated the case incidence was 9.8 per cent., and deaths were 1.2 per cent.; among the vaccinated there were no deaths, and 1.2 per cent. only were attacked. Some evidence is thus afforded in favour of vaccination, and of a consequent decrease in the severity of the secondary infections.

When prophylactic vaccination is begun after the epidemic has reached the district concerned, it is necessary to remember that as the epidemic progresses those inoculated will include a constantly increasing proportion of persons who are relatively insusceptible; the comparison of incidence among the uninoculated and inoculated is therefore fallacious. An account of the attempted prophylaxis among the employees of three manufacturing companies may, however, be given for what it is worth: 12,251 employees had influenza, and 40,400 escaped. Of 16,270 persons who received four inoculations of a mixed vaccine, 2,790, or 17.2 per cent., were attacked by influenza; of 15,560 persons not inoculated, 4,333, or 27.8 per cent., passed through an attack. The percentage mortality diminished as the number of received inoculations increased. It should be stated that these statistics are subject to other fallacies besides the one mentioned above; three different vaccines were employed, the injection had in some cases to be given by nurses, and in many instances the figures were based on the assumptions that any employee who had fever and was sick for three days had influenza, and that if he was confined to bed for seven days or more he had pneumonia. It is concluded, therefore, that by this method of investigation no convincing evidence was obtained that the administration of a vaccine during an epidemic diminishes the number of cases of pneumonia or decreases to any appreciable extent the death rate. There was, however, an indication that the use of vaccines prior to the arrival of the epidemic may lessen the number and the severity of secondary pneumonias. This is in accordance with the conclusions of Eyre and Lowe,[1] who, working in New Zealand, compared influenza as it occurred among 16,104 men who had received full prophylactic inoculation of a mixed vaccine, and approximately 5,700 who were uninoculated, or had received only one dose; 1.3 per cent. and 4.1 per cent. respectively of the two groups suffered from influenza, while 8 per cent. of the severe cases among the inoculated died, as compared with 23 per cent. among the uninoculated. The death rate for all infected cases was 0.26 per cent. among the inoculated, and 2.2 per cent. among the uninoculated. Among other instances in which groups of individuals were inoculated before being reached by the epidemic are the American naval cases investigated by Minaker and Irvine.[2] These observers found that only 35 cases, with 1 death, occurred among 1,950 marines who were released from quarantine immediately after completion of their inoculation, and were turned into Valego and San Francisco, where influenza was at its height; among a control group of 8,232 unvaccinated persons there were 1,296 cases of influenza, with 65 deaths. Among another series of 3,514 vaccinated men released from quarantine in the midst of an epidemic, 15 only had influenza and there were no deaths. Although the numbers concerned were small, allusion must be made to the experiments of McCoy, Murray, and Teeter,[3] who found, contrariwise, that the incidence, severity, and mortality of influenza were slightly greater in the inoculated moiety of 780 asylum patients vaccinated before the occurrence of the first case.

[1] *Lancet*, April 5th, 1919.
[2] *Journal of the American Medical Association*, March 22nd, 1919.

Ireland.

IRISH HEALTH GRANTS.

THE Irish Public Health Council recently made representations to the Chief Secretary regarding: (1) The allocation of a substantial share to Ireland of the £700,000 which is allocated for voluntary hospitals from the National Relief Fund; and (2) the dangers that would be entailed to the health of the community if the State grants to local authorities for health services were withheld.

Dr. E. Coey Bigger, chairman of the Public Health Council, has received the following reply from the Chief Secretary:

Chief Secretary's Office, Dublin Castle,
September 30th, 1920.

Dear Sir,

The Chief Secretary desires me to inform you that he has considered the proposals submitted to him by the members of the Irish Public Health Council, who called upon him on the 21st instant.

With regard to the Council's request that a full share of the £700,000 voted by the Committee of the Prince of Wales's Fund for voluntary hospitals may be secured for hospitals in Ireland, the Chief Secretary is pleased to be able to inform the Council that Ireland will get its due proportion of the money, which will be allocated among the hospitals upon certain definite principles which will be applicable to the hospitals elsewhere in the United Kingdom.

The Chief Secretary much regrets that he is not able to give the Council an equally favourable reply to their suggestion that the grants for public health service should be continued notwithstanding the refusal of the public health authorities to submit their accounts to audit. The Local Government Board are bound to certify after audit whether the expenditure in respect of which these grants are made has been duly and properly incurred in accordance with statutory rules and regulations, and they would not be empowered to dispense with these conditions even if it were defensible to do so.

As grants are made, in some cases, on account of the current year's expenditure before the audit takes place, it became incumbent on the Board, owing to the resolutions passed by many of the local authorities determining to ignore the authority of the Local Government Board, to ask for an assurance from these councils that if the advances on account were issued, the Board would not be debarred from fulfilling its statutory obligations to Parliament of certifying the expenditure.

The responses to the Board's circular asking for this assurance have made it quite plain that many councils have no intention of agreeing to the audit and complying with the conditions upon which the grants of public money were made. Some councils have dismissed their official treasurers (in every instance a bank), and have made illegal arrangements by which all funds coming into their hands shall be paid to private individuals as trustees for the ratepayers, while other councils have declared that all statutory rules and orders shall be disregarded, and that every obstacle shall be placed in the way of the Government.

It can hardly be expected that public moneys shall be entrusted to local bodies who take up this position. But in any case, as the law at present stands, the Local Government Board are not possessed of any discretion which would enable them, even in circumstances of the direst necessity, to make advances of public money to local authorities which had thus signified their intention of refusing to account for it according to the regulations.

All that the Public Health Council has urged as to the appalling misfortune which will befall the people of the areas where the beneficent services for the treatment of tuberculosis, child welfare, and other vital public health purposes are suspended, the Chief Secretary fully realizes. But the responsibility for the suspension of the services must rest solely with the councils which have precluded the Board from issuing the grants by their defiance of the law. They have it in their power at any moment to enable the Board to release the money by intimating their willingness to abide by the conditions as to the audit and rules under which the subsidies were originally made, and it appears to the Chief Secretary that the real appeal lies to those local bodies which prefer to sacrifice the health and the lives of the children, the poor, and the afflicted rather than submit to the reasonable and legal conditions as to the examination of their accounts to which no local authorities in the past have ever objected.

[3] Ibid., December 14th, 1918.

A large number of the local authorities have already given the Local Government Board the assurances they require and are receiving the State grants in full, and the Chief Secretary cannot discriminate and make special arrangements by legislation or otherwise to enable other councils to be treated more favourably and relieved from all responsibility for the consequences involved by the repudiation of their bargain with the State.

Some members of the Public Health Council have suggested that many local authorities are quite prepared to allow their accounts to be audited and to conform to the law and the regulations, although they have not explicitly said so in reply to the Board's circular. This, of course, remains to be proved, and if the auditor in such cases is given the usual facilities and completes the audit and passes the accounts and certifies that the expenditure, in respect of which recoupment is claimed, has been duly and properly incurred, and any other obligations towards the Government have been duly met, the public health grants will follow as a matter of course, and the assurance required by the Board will then become superfluous.

But if this really represents the intentions of any councils, it would be better for them to at once notify the fact to the Board so that the usual grants on account of the current year's expenditure could be issued without waiting till next year when the time for the audit will arrive.

More than this the Chief Secretary is unable to promise. If the course suggested is taken, the claim of each council, as it comes up, will be duly considered, and where the statutory obligations of the councils towards the Government are fulfilled, and the authority of the local government is recognized, and a legally appointed treasurer exists, the Government will gladly direct the grants to be made.

This promise applies equally to all statutory committees of the county councils or district councils, and boards of guardians which have a separate audit and have not associated themselves with the policy of the councils of their county on the repudiation of the Local Government Board's regulations.

In the case of these bodies the Irish Government will give favourable consideration to any application they may make for the direct payment of the State subsidies to their own treasurers instead of to the county councils on their behalf as heretofore, provided that their accounts are certified by the Local Government auditor, or that in the case of an application for an advance on account of the year's expenditure it is accompanied by an undertaking from the Committee that the expenditure will be submitted to the auditor at the proper time and that all their statutory obligations towards the Government are fulfilled.
—Yours truly,

(Signed) C. J. Gregg.

E. Coey Bigger, Esq., M.D.,
Chairman, Irish Public Health Council, Dublin.

In connexion with the withholding of the Government grants for Irish health services it must be borne in mind that the Criminal and Malicious Injuries (Amendment) Act, 1920, provides that the treasurers of the Irish health authorities shall, out of the first moneys under their control, meet decrees made under the Act. This would mean in many counties, owing to the number of malicious injuries and the high awards granted for compensation, that after the funds had met such charges no money would be left to pay for the public health services, including the salaries of Irish Poor Law medical officers. The Irish health authorities, apart from other objections, apparently consider they would lose more than they would gain by giving the undertakings asked by the Government in order to receive the grants for health services.

In connexion with the withholding of the grants the following letter has been addressed to the Lord Mayor and Corporation of Dublin:

My Lord,

The undersigned view with dismay the lamentable and untoward effect on the public health of Dublin which would inevitably follow the closing of the existing machinery for dealing with public health, and especially with tuberculosis—that disease which has exacted such a heavy toll on the health and welfare of the civic population.

We also recognize what a hardship would be inflicted on poor persons of feeble intellect by the proposed partial closing of the Richmond Asylum.

For these reasons alone we are willing to offer our services to receive and distribute the moneys which the above services should receive from the Treasury, on the conditions, first, that the accounts in full of these institutions be furnished to us in order to be audited by the Local Government Board for Ireland, and second, that we, as trustees, incur no financial liability in regard to the administration of the institutions involved.

Subject to the approval of this scheme by the Municipal Council, we would be willing to approach the Treasury with a view to obtaining their assent to our proposals.

James Craig, President, R.C.P.I.,
Edward H. Taylor, President, R.C.S.I.,
Wm. F. Delany, Governor, Apothecaries' Hall,
John W. Moore, M.D., President of the Royal Academy of Medicine,
James S. Ashe, Honorary Secretary.

Scotland.

Small-pox and Typhus Fever in Scotland.

A marked decrease has taken place in the number of cases of small-pox occurring in Glasgow during the past fortnight, so that at the end of last week (October 9th) only about seventy persons were undergoing treatment in the city hospitals. Stray cases are being reported elsewhere throughout Scotland. Thus, during the same week two deaths from the disease took place at Crofthouse Hospital, Ayr, and eleven patients are there being treated. A woman who had come from Glasgow to Wick has now been isolated in the small-pox hospital in that town as she was found to be affected. A third case of small-pox has occurred at Dunfermline—a man who had been working at Rosyth Dockyard. On October 8th the *Glasgow Herald* reported four deaths from typhus at Greenock, several other cases being under treatment and all the contacts under observation.

Edinburgh University.

Entries for the Faculty of Medicine in the University of Edinburgh were closed last April, the fixed maximum having then been reached, and as regards science the same thing happened in June, when some two hundred students had to be refused for this session. On October 6th 1,009 medical students had already matriculated, so that the number for last session is likely to be passed; among these were fully 180 "freshers," including 40 women. The addition to the Anatomy Department at Teviot Place and the new chemical laboratories at the King's Buildings (Liberton) are being proceeded with as rapidly as possible. On October 30th the election of a Lord Rector will take place; Earl Beatty is the present holder of the office. The Prime Minister (Mr. Lloyd George) is the Coalition candidate, and Professor Gilbert Murray is being supported by the Edinburgh University Students' Liberal Association.

India.

The Prevention of Blindness.

The population of India, as ascertained by the census of 1911, was 315 millions, and it is calculated that there are about 600,000 blind persons. This estimate relates to the totally blind. It does not include people who are going blind or people with some degree of vision, nor those whose defective sight is such that, though not altogether blind, they would, in England, be regarded as fit subjects for a blind school. If all these were included the number would be vastly increased. In all countries where there is intense sunlight, great heat, and much dust, a high incidence of blindness will probably be found, unless the population is sufficiently advanced and intelligent to take the necessary precautions—witness Syria and Egypt, and some of the Balkan territories, with their intense heat in summer and a dust-laden atmosphere. In India itself the dry, hot areas like Sind are much worse in the matter of blindness than the comparatively cool, damp, and greener tracts like the Konkan.

Mr. C. G. Henderson, of the Indian Civil Service, in a pamphlet entitled *Blindness in India and the Possibilities of its Diminution*,[1] has given an account of his personal investigations in the districts of India in which he has worked. His statement of the high incidence of blindness is lamentable, and his account of the lethargy of the people in the face of their afflictions and the little that is done to bring home to them the possibilities of relief calls for the attention of those who have the interests of that great country at heart. The Indian peasant, he says, fails to realize the danger of eye complaints which may, if neglected, lead to blindness. Even where medical facilities are near at hand he often fails to take advantage of them, and when for a complaint which he may regard as trivial he has to travel many miles and attend regularly at a distant dispensary he remains in his village and suffers the consequences of his neglect. The Indian public would like medical facilities to be brought almost to their very doors, and

[1] *Blindness in India and the Possibilities of its Diminution.* By C. G. Henderson, I.C.S. Bombay and Madras: Oxford University Press. 1919. (Cr. 8vo, pp. 54. 12 annas.)

many an eye is destroyed by the travelling quack who visits villages and persuades his patients to submit to his unskilled operations. There are thousands of blind persons in India who could obtain some measure of sight if they would submit to a surgical operation. Cataract is one of the commonest causes of blindness, and may come on as early as 30 to 35 years of age. Small-pox takes a heavy toll of sight. Trachoma, conjunctivitis, and keratitis add to the heavy list; and ophthalmia neonatorum is very destructive. Midwifery is mainly in the hands of *dais*, who are unqualified midwives, entirely without education, dirty in their habits, and primitive in their ideas; 90 per cent. of the maternity cases are attended by these women. The efforts made during the last few years to teach them something, improve their methods, and supervise their work have met with success, but must be extended.

The broad lines on which the work of reform might, Mr. Henderson conceives, be attempted are something as follows:

1. Campaigns against ophthalmia neonatorum; even if at first confined to the cities, the work would be of the greatest importance.
2. Finding out the blind and attempting to bring the benefits of modern surgery to them.
3. The setting up of village medical agencies to keep in constant touch with the sufferers.
4. The establishment of travelling hospitals and dispensaries connected with the larger more centrally situated hospitals of the great towns.

In an appendix a number of cases are cited of blind persons who were brought under surgical treatment so that sight was regained. There is a foreword by Colonel Elliot, in which he writes: "The pity of it all lies in the fact that so much could be done to rescue these poor people if their true condition were once realized by their more fortunate fellows."

The Pasteur Institute, Shillong.

The third annual report of the King Edward VII Memorial Institute, Shillong, states that, during 1919, 1,406 patients, or 40 per cent. more than in 1918, underwent the full course of antirabic treatment. Two patients died of hydrophobia during their treatment, 7 from hydrophobia within fifteen days of completing the treatment, and 6 more than fifteen days afterwards; thus the total hydrophobia death rate was 15 deaths out of 1,408, or 1.07 per cent., and the failure rate 0.43 per cent. Jackal bites were next in frequency to dog bites, and were the most important cause of rural cases. Treatment of kala-azar by intravenous injections of tartar emetic has reduced the mortality from this disease in Assam from 90 per cent. five years ago to a figure approaching 25 per cent. In the course of treatment 200 cg. of tartar emetic are given intravenously, in 1 per cent. solution, over a period of two and a half to three months. The chance of finding Leishman-Donovan bodies in blood films is reported to be greatly increased if 1 c.cm. of liquor adrenalini (*B.P.*) is given half an hour before the blood is removed. Numerous bacteriological studies have been made of Naga sore, the transmission of which is probably due to flies. Films made from the pus contained, in addition to cocci and spirochaetes, a fusiform bacillus, which appears to be identical with that of Vincent's disease. The conclusion is reached that Naga sore is merely Vincent's disease, affecting not the mucous membranes, but the skin tissues. For prophylaxis of influenza a mixed vaccine was manufactured on a large scale and used extensively. The conditions among the inoculated and the uninoculated varied so greatly that little statistical value attaches to the collected results.

A faculty of medicine will shortly be organized at the Polish University of Posen. Several new buildings have recently been added to the University of Cracow, including institutes for clinical medicine, obstetrics and gynaecology, and microbiology. Dr. Ciechanowski, professor of pathological anatomy, has been elected rector.

The University of Heidelberg has received half a million marks from F. Behringer of Bielenfeld for the erection of an institute for the study of the chemical constitution of albumin. Until the institute is completed the researches will be carried on in the physiological institute under the direction of Kossel.

Correspondence.

THE MEDICAL SERVICES IN INDIA.

Sir,—I am much obliged to you for your invitation to give my views on the subjects raised in connexion with your leading article of October 9th on "The Medical Services in India."

In the first place I wish to support as strongly as possible every word you have written in that article. The really big thing, indeed the only thing that matters, is to get the best possible medical service for India, a service which will attract the right class of man, and will give the Indian Empire the fullest possible value. No question of sectional or Service interest must be permitted to stand in the way.

The British Medical Association has promised, and is giving, its support to the Secretary of State for India in recruiting for the I.M.S. in return for his very statesmanlike appreciation of the medical position in India. Whether it is possible for any body, however powerful it may be, to achieve this purpose which we share with the Secretary of State, must depend very largely on the evolution of affairs in India itself. A wise, wide, statesmanlike plan such as that put forward by the Verney Lovett Committee, will, if carried into effect, go a very long way to rehabilitate the medical service in India. On the other hand, the continuance of the present condition of jealousy, overlapping, and schism will assuredly be disastrous to the future. It is most important that this matter should be put clearly and squarely before the Government of India, before the peoples they govern, and before the wider Empire, which takes an interest in the welfare of each and every part of His Majesty's dominions.

The Esher Committee lays stress on the importance of a unified service, and admits that the Verney Lovett report puts forward the only feasible scheme for the formation of such a service, but denies its support to that recommendation on what appear to me to be wholly partisan grounds. The arguments that the Esher Committee adduces in favour of this lamentably weak policy are feeble to a degree. They may impress a committee of laymen; they will not carry weight with expert medical men.

During the years that I have had the honour to be Chairman of the Naval and Military Committee I have had ample opportunity of studying the trend of thought and the policy of the British Medical Association. The Association has no interest in the rivalries and disagreements of different services. Its one desire is to put the interests of medical men and of those they serve in the front rank, and I am confident that the support which it can and will give to the Government of India in the future must and will be largely determined by the way in which that body handles large questions of medical policy, such as those raised by the Verney Lovett report.

It is most deplorable that we should have been deprived at this anxious time of the help of Sir William Babtie. I had many opportunities of discussing with him questions allied to those now under consideration. I had looked forward to the day when he would be the Chairman of the Naval and Military Committee, with both the will and the intention to develop the great scheme of his later years—namely, the institution of a unified medical service, both on sea and land, for the length and breadth of the British Empire. In this I had promised him my whole-hearted support. He was far ahead of his time, but the Verney Lovett Committee would appear to have been not far behind him, for its report foreshadows, if dimly, an aspiration in the same direction, to which the formation of an Indian Medical Corps is merely a stepping-stone.

I trust that you will believe that in writing as I have done I am endeavouring to personify the policy of the Association to put the empire first and personal considerations by comparison nowhere. I am not writing as one who once belonged to the I.M.S., but as one who feels that great history is now being made, and that the responsibilities for making it aright are very grave indeed. I would not hesitate to sacrifice any or every interest to that of the greatest good of the greatest number.—I am, etc.,

R. H. Elliot,
Chairman, Naval and Military Committee,
British Medical Association.

London, W., Oct. 10th.

THE MOBILE PROXIMAL COLON.

Sir,—Mr. John Morley, in his interesting article on the mobile proximal colon in your last issue, refers to one of mine on the same subject published in the *British Journal of Surgery*, January, 1920. He is able to condemn it in a few incisive sentences, and I do not feel able or inclined to defend it with similar brevity and without undue trespass upon your space. I am contenting myself, therefore, with a few comments upon his references to my article, and with the observation that they only deal with the fringe of the subject. He quotes, apart from its context, a sentence from the middle of my article that "the second part of the duodenum is the site most liable to ulceration." He omits to quote any of the seven preambles in the form of questions which govern the whole of what is written subsequently. No. 4, on the second page of the article (p. 344 of the *British Journal of Surgery*), reads:

> Why are gastric ulcers clustered around the pyloric region of the stomach, and why is it that duodenal ulcers are almost always in the *first and second* parts of the duodenum?

This was meant in addition to emphasize by omission the universal knowledge that there is an ulcer-bearing area extending from the prepyloric portion of the stomach to the level where the hepatic flexure of the colon crosses the duodenum, and that the relative immunity from ulcers of the cardiac portion of the stomach and of the infracolonic portion of the duodenum is a most astounding phenomenon in view of the current theories that these ulcers have a toxic, chemical, bacterial, or cytotoxic origin, or even result from "caecal stagnation and catarrh," which he asserts are causal agents, but the "precise manner" of whose action is still hidden from him. All of the 208 adults and 111 children whose operations formed the basis of my article had "caecal stagnation and catarrh." Ten of the adults had ulcers, and all of the children were free from them!

In studying the association of a mobile proximal colon with gastric and duodenal ulcers, he has frequently found a difficulty in exposing "the appendix through the ordinary upper rectus incision owing to normal fixation of the ascending colon." He must forgive me for saying so, but this is only evidence that the ascending colon was fixed in the region of the appendix. The only evidence that the ascending colon "is fixed in the normal way" is when it has been found to be so by inspection and palpation of its whole length—and this is not possible through the incision he describes. The upper half of the ascending colon, as I described in my article, quite frequently retains its primitive mesentery, while the lower half is fixed in the normal way. These observations on the collective structural malformations of the alimentary tract were made upon a series of 319 operations (the number is nearly 500 now), during the course of which the whole of the abdominal and pelvic viscera, with the exception of the spleen, were inspected and palpated as an essential preliminary to any form of operative treatment. (Incidentally, for the last two years, I now turn the right rectus outwards instead of inwards, and refuse to operate without two assistants, the sole duty of one being to hold the right rectus out of the way. All incidental and accidental snapping of nerves is thus avoided.) Twelve more cases of these rare diseases (gastric and duodenal ulcers) have fallen to my share since the article was written. In four of them the upper half of the ascending colon retained its primitive mesentery, and in the remaining eight the ascending colon was mobile over its whole length. That Mr. Morley is unconvinced by my writings is very regrettable to me, but that I have "not attempted to justify" my "very questionable hypothesis" is a discourtesy to him of which I must plead guiltless. He must forgive me once more. I attempted very hard indeed, and although the attempt is so poor in his opinion, he must have the charity to believe that it was made, and that it was my best. He is clearly so interested in the mobile ascending colon—in fact, I suspect him of a deeper regard for its possibly morbid action than for the present he is inclined to admit—that I do hope he will be persuaded to publish in full detail the knowledge in his possession whereby he can "reject quite confidently the mechanical theory recently advanced by Waugh," the value of which would be inestimable. At the same time I hope he will include a detailed account of any *post-mortem* examination he may possibly have had the opportunity of making upon any patient upon whom at any time he performed the operation of "plication of the colon and caecum," so that we may have incontrovertible evidence that for the rest of the patient's lifetime, at any rate, "the lumen of the gut was permanently narrowed." Such simple facts would be most refreshing, and should not expose us unduly to the charge of a morbid "craving for simplicity."—I am, etc.,

London, W., Oct. 10th. George E. Waugh.

"THE RIGHT TO STRIKE."

Sir,—A certain section of the Press, by the simple stimulus of a free matinée, recently succeeded in obtaining from clergymen their various opinions around and about a burning question. The same process is now being applied to doctors, who, I hear, have been asked to witness, in company with industrial leaders, social workers, and publicists, a play dealing with the strike problem to which you refer in your issue of October 9th. Moreover, each member of the audience is asked to answer by letter the questions: "Are doctors justified in counter-striking? Are reprisal strikes desirable?" It is clear from the character of the invited audience that strikes and labour leaders and doctors are all associated in the minds of the promoters; and apparently with justification, for they state that they are receiving large numbers of applications for seats from medical men, who surely have every right to go if they so desire without drawing any comment from their fellows. Nevertheless, the circumstances beget some thoughts which may be expressed without offence.

A strike is the outcome of an irreconcilable difference between employer and employed. The word strike has a collective meaning, and I would apply it to an organized movement affecting a number of individuals. One man alone cannot strike. He may leave his work in an endeavour to enforce his demands, but his solitary act does not constitute a strike. The word should be used only in its correct sense; it not only expresses an act, but an attitude of mind towards an act. Thus if a body of men approach their employer and ask for higher wages which he refuses, and then proceed to give him a week's notice which he accepts, that act is not a strike. But if when the deadlock is reached both sides assume a defiant attitude, and the men do not give notice but nevertheless threaten to stop work, and the employer accepts the situation and likewise abstains from giving them notice, then all the conditions of a strike are fulfilled. Note well that the work itself takes no part in, and endures nothing as a consequence of, the dispute.

These conditions cannot at the present time be reproduced in the medical world, for two reasons mainly. In the first place, in contract practice a dispute might arise leading to a deadlock, but it is certain that no body of doctors would do more than proclaim their intention of not renewing the contract on the same terms. A strike would involve a dishonourable breach of a contract already agreed upon. In private practice such a situation could not arise. The medical attendant would either withdraw or be dismissed from the case. In the second place, the character of the work prohibits absolutely anything in the nature of a strike. It has been said that in an industrial strike the work itself does not endure anything (even in the case of perishable foodstuffs it is not the food, but the people who are deprived of it, who suffer); but in medical practice the work is the patient and the patient is everything; and if anyone can say that he has it within him to strike—that is, to abandon his patients and flatly refuse to see them in any circumstances—then the sooner he realizes that he has no moral right to be called a doctor the better.

There are some who still seek to trail the name of Medicine in the mud by advocating the adoption of industrial methods of settling disputes. Let them go on. Their historical credit will not be greatly adorned by such a record. Our general mental level may be none too high, but the recent negotiations with the Ministry of Health showed conclusively that any method resembling a strike is abhorrent to the vast majority of medical men, and embraced only by the fire-eating few.

The practice of medicine stands apart from any other calling, and those who seek to instil into it the methods of the office and the shop, or to associate it in any way with such an act as a strike, only reveal their own sad

lack of the spirit which the public are entitled to expect to animate their doctors.—I am, etc.,

W. A. Stokes.

October 10th.

Sir,—I think most medical men will agree with me that we, as a profession and as really the most powerful of all bodies, are responsible to mankind, society, the country, and the Empire if we do not bind together to curb labour in its present destructive and irresponsible attitude towards the rest of the community. A little while ago the profession at once put an end to a railway strike in the south of France by refusing to attend, directly or indirectly, to persons or their families connected with the strike. If the medical profession acted up to its responsibility in England and Scotland it would do away at once with the dreadful prospect ahead of us in Ireland, Great Britain, and the Empire.—I am, etc.,

R. W. Burkitt.

Nairobi, British East Africa, Sept. 15th.

ANTIMONY IN KALA-AZAR.

Sir,—Dr. J. Dodds Price's letter in your issue of September 18th, advocating the use of the sodium salt of antimony, will be of the greatest interest to practitioners in the tropics who have kala-azar cases to treat. The cough, nausea, and retching which frequently occur after the intravenous injection of tartar emetic solution are a serious disadvantage to the use of this salt. Although I cannot claim to have administered thousands of injections, yet I and my assistants in Madras have administered some hundreds of injections, in many cases carrying the dosage up to 10 c.cm. of the 2 per cent. solution of tartar emetic in normal saline. Severe cough, nausea, and retching has been met with in a number of these cases, but as a rule these symptoms have occurred only when the dose has attained or exceeded 6 c.cm. By giving the injections on an empty stomach, and keeping the patient "absolutely still" for ten minutes after injection, the coughing and retching is minimized, but there are a number of cases in which such precautions fail to prevent these symptoms occurring.

Dr. Dodds Price recommends the use of the sodium salt of antimony tartrate in a strength of 1½ grains in 10 c.cm. of normal saline, the maximum dose being 10 c.cm., as he says this salt is less liable to produce cough, nausea, and collapse than the potassium salt. It is possible, however, that these symptoms might be produced even by the sodium salt if used in a 2 per cent. solution with a maximum dose of 10 c.cm., which contains over 3 grains of the salt, but the great advantage of the sodium salt appears to be that it is efficacious in curing kala-azar in considerably smaller doses than the potassium salt, and so toxic effects are avoided. If these smaller doses of the sodium salt do indeed prove efficacious, the use of this salt, which is easily obtained, will certainly prove a marked advance in the treatment of kala-azar, for the cough, nausea, and collapses produced by the potassium salt sometimes result in the patient (or his parents in the case of a child) refusing to permit the treatment to be continued until an apparent cure is effected; and in my experience cases which have undergone an incomplete course of injections of tartar emetic are very difficult to cure if a relapse occurs.

I should like to endorse Dr. Dodds Price's statement that a case of kala-azar can only be considered cured provided that in addition to prolonged absence of fever there is marked diminution in the size of the spleen. This latter sign is a most important, if not the most important, clinical sign of cure, for I have had the opportunity of following the subsequent history of some of my patients, and have noted that those in whom there was marked diminution in the size of the spleen during treatment have had no relapse, and the spleen has continued to diminish in size until it has disappeared beneath the costal margin a few weeks after ceasing treatment. On the other hand, I have had the unfortunate experience of finding that in some patients who have ceased treatment before there has been marked diminution in the size of the spleen, the disease has recurred within a few months, and has not been cured by a further course of injections, though temporary improvement has followed in some cases.

It seems to me, therefore, that once having commenced the treatment it is essential to continue the injections until apparent cure is effected, as indicated by prolonged absence of fever with marked reduction in the size of the spleen.—I am, etc.,

F. F. Elwes, M.D.,
Lieut.-Colonel I.M.S.

London, W., Oct. 11th.

TUBERCULOUS MILK.

Sir,—In your review of Dr. Marcus Paterson's book, *The Shibboleths of Tuberculosis*, you state that "he suggests that the ingestion of a moderate amount of tuberculous poison during childhood may have an immunizing effect in the long run." I understand that this theory has already been propounded by a few tuberculosis experts. One cannot imagine a more pernicious half-truth being promulgated. It is one which, if it gains ground, will certainly handicap the sufficiently difficult work of district medical officers of health in combating tuberculosis in milking herds. The 10,000 children under 5 years of age who die annually in England and Wales from tuberculosis have evidently ingested an immoderate amount of tuberculous poison. The majority of milking herds in this country are not submitted to veterinary inspection. Recently, when my three rural councils applied for permission to appoint veterinary officers, they were advised to postpone such action pending the legalizing of the Milk and Dairies (Consolidated) Bill, which vests county councils and county boroughs with the necessary powers for this purpose. At present I am dependent upon voluntary notification from private veterinary surgeons. In this way I have had many tuberculous cows destroyed and the herds submitted to the tuberculin test.

The campaign against tuberculosis has in the past suffered much from "views" and "cures." These come and go, but still the most readily preventable of infectious diseases continues to take its toll of hundreds of thousands of wage earners and producers. Scientific leaders amongst medical men should be absolutely sure of their ground before they make statements on highly controversial subjects, otherwise the lay mind is confused. Some of my councillors, who had heard of the theory in question, were with difficulty convinced of the necessity of measures being taken to improve the milk supply. It was argued that if doctors say tuberculous milk is good for children, then dirty milk cannot be so harmful as it is said to be.—I am, etc.,

S. Nicol Galbraith,
Medical Officer of Health.

Newark-on-Trent, Oct. 6th.

NERVOUS AND FUNCTIONAL DYSPEPSIAS.

Sir,—While the paper with which Dr. Arthur Hurst opened the discussion on the diagnosis of the nervous disorders of the stomach and intestine is obviously the outcome of brilliant and painstaking work such as we are accustomed to expect from him, it seems to me—a general practitioner—to include too much in the term nervous disorders. Allowing cancer of the stomach, peptic ulcer, and gastritis to be organic diseases, he apparently classifies all other forms of dyspepsia as of nervous origin.

Are we not all too prone to misuse the word "functional"? Dr. T. Lewis, in a lecture on heart disease some months ago, pointed out how it was misused in that connexion, and in the same way there is a tendency to assume that functional diseases of the stomach are also of nervous origin. If the stomach is not fulfilling its average duty, if it fails to secrete enough or if it secretes too much gastric juice, if its motility is slow or over-active—these are functional defects whether organic disease be present or no—but are we justified in assigning a nervous origin to all of them?

Laboratory experiments are of course essential to the proper understanding of the fundamentals of disease, but when the stomach is only discussed in terms of test meals and *x*-ray findings are we not apt to overlook the fact that few, if any, diseases can be said to belong to a single organ? Tonsillitis, endocarditis, nephritis, pneumonia, for example. Each of these is only the salient feature of a general toxaemia, and in a similar way many of the so-called functional dyspepsias are not of nervous origin. Take the idiosyncrasies against a certain food that occur in an occasional healthy subject. This, it has been suggested, is in the nature of an anaphylaxis, and the

perverse behaviour of the infant stomach may perhaps be similarly explained. We know how a normal baby digests its mother's milk thoroughly one day and the next has a severe attack of indigestion because some worry or excitement has affected the maternal secretion.

I think, too, that Dr. Hurst exaggerates when he ascribes all flatulence—apart from that of organic disease—to swallowed air. If this is so, what is the nature of the gas that a dose of peppermint or other carminative never fails to expel from a healthy stomach? Is not a certain amount of gastric fermentation a normal process?—I am, etc.,

Westcliff-on-Sea, Oct. 5th. T. Blanchard Sellors, M.D.

THE EYE AND MOUTH IN SLEEP.

Sir,—Mainly with the object of ascertaining whether the closed mouth in the human being was the natural physiological state, some fourteen years ago I made some observations with regard to respiration during sleep on three classes of individuals: (1) Infants during the first few days of life while still in a lying-in ward; (2) patients in the phthisical wards of a Poor Law infirmary; (3) aged people, from at ages ranging from 80 to 100 years, in the dormitories of a large workhouse.

I am not in a position to reproduce figures, but the main impressions I gathered were as follows: (*a*) I found that healthy infants invariably slept with the mouth shut. The few exceptions who slept with the mouth open were found to be suffering from an early snuffles which set in about the third day. (*b*) Among phthisical patients an abnormal number were mouth-breathers with narrow nostrils and narrow chests. (*c*) Among the old people the closed mouth was the rule during sleep. Many of these people had the Roman type of nose with large bean-shaped nostrils. With regard to the closure of the eyes during sleep, I have noticed that certain children when ill often have the lids partly open during sleep—sufficient to show the eyeballs rolling about.—I am, etc.,

Frank B. Skerrett, M.B., B.Sc.Lond.

London, E., Oct. 4th.

MORTALITY OF VENEREAL DISEASES.

Sir,—Are not all such discussions as that now proceeding in your columns futile, unless we remember and appreciate two dicta of the late Dr. Mercier?

(1) *A* disease . . . has no existence *in rebus naturae* or *in rerum natura*, but is a mental concept;

(2) *The* cause of an effect is that cause in which for a certain purpose we are most interested.

Were these fundamental and indisputable truths properly appreciated, many of the differences between medical controversialists would disappear; and, were they taught in the medical schools, students and teachers alike would not be in the state of bewilderment that a perusal of recent medical addresses shows clearly to obtain nowadays.—I am, etc.,

London, W., Oct. 10th. F. G. Crookshank.

DEATH AFTER TONSILLECTOMY.

Sir,—In his interesting memorandum on this subject (September 18th, p. 438) Dr. Sladden states "apparently there was cardiac failure," although previously he stated that "the heart, save for a moderate degree of dilatation of the right auricle, appeared entirely normal." There was no dilatation of the left auricle and no congestion of the lungs, so that the mere dilatation of the right auricle is the only criterion of cardiac failure. Is it a sufficiently good one? To estimate a small degree of dilatation is extremely difficult, and for purposes of comparison the statement is not very helpful, even if accompanied with the actual increase in capacity.

May I suggest, as a result of my experimental work in this connexion, that it be advisable at all *post-mortem* examinations to estimate the intrapericardial pressure, for so far I have found that this pressure, which in health is negative to the extent of 4 centimetres of water, becomes atmospheric in cases of cardiac failure. If my contention be correct, then an estimation of this sort will give us some definite standard to work with. Accompanying this variation of pressure it is found that the quantity as well as the specific gravity of the pericardial fluid varies so that it would be well in all reports to include data of this sort.

Dr. Koch's letter in your last issue emphasizes the importance of such a suggestion, because undoubtedly the chemical chloroform reacts adversely on hyperthyroidized blood, and consequently on the secretions.—I am, etc.,

Swansea, Oct. 11th. G. Arbour Stephens, M.D.

Obituary.

WILLIAM MURRAY, M.D., F.R.C.P.,

Newcastle-upon-Tyne.

On October 4th, at Scaurbank, Longtown, Cumberland, where, as also at Armathwaite in the same county, he had lived in comparative retirement since he left Newcastle several years ago, Dr. William Murray passed away at the age of 81. The news of his death was received in Newcastle with regret, for there are still many persons living on Tyneside who are grateful to his memory for medical services rendered to them or to their friends.

A native of Chester-le-Street, co. Durham, Dr. William Murray retained a strong affection for the North of England. From Durham school he went to the medical school and Royal Infirmary, Newcastle-upon-Tyne. He then went to University College Hospital and afterwards studied in Paris. He obtained the M.R.C.S. and L.S.A. diplomas in 1859, the M.D. degree of Durham University in 1862, and the M.R.C.P. diploma two years later. In 1872 he was elected a Fellow of the Royal College of Physicians of London. Although he never held an infirmary appointment, he yet succeeded in securing a large consulting practice in the northern counties. As a specialist for diseases of women his opinion and assistance were much sought for, but his wide knowledge and intuition made him equally distinguished as a general consultant. His strong personality, fine presence, attractive manner, and discernment not only made him an acceptable presence in a sick-room, but explained why his professional attainments were so highly appreciated by his confrères.

For fourteen years he lectured on physiology in the Newcastle School of Medicine. His lectures were marked by an originality and breadth of interpretation which the students enjoyed. Dr. Murray outlived nearly all his contemporaries. Of his old pupils who are fortunately still with us may be mentioned Dr. John Hedley of Middlesbrough; between these two from first to last there remained ties of the closest friendship.

Dr. Murray contributed important papers to the medical journals. One of his books, *Rough Notes on Remedies*, is well known, for it has passed through several editions, so admirably does it meet the needs of the general practitioner. To the deceased belonged the honour of having cured the first case of abdominal aneurysm by pressure. It was accomplished by relays of willing assistants. As a student of Sir William Jenner and Sir Alfred Garrod Dr. Murray carried on the high traditions of the practice of medicine of their time. Medicine kept ever presenting to him fresh problems for solution. Over these he pondered, not only when in the armchair in his study but in his country pursuits.

It was after a breakdown in health in the early part of his professional career that Dr. Murray decided to indulge in a long holiday and took up fishing and shooting, in both of which he afterwards became an adept. He was a keen and successful angler, many a salmon having succumbed to his lures.

Dr. Murray played an important part in founding the Young Men's Christian Association in Newcastle; he was its first president and held the office for many years. Twice married, he leaves by his second marriage a widow and daughter. One of the sons by his first marriage is Professor George R. Murray, who holds the Chair of Systematic Medicine in the Victoria University of Manchester. Dr. William Murray's remains were laid to rest in Arthuret Churchyard, Longtown, Cumberland, on October 6th.

RICHARD DAVY, M.B.Edin., F.R.C.S.Eng.,

Consulting Surgeon, Westminster Hospital.

Mr. Richard Davy, who died at his house, Burstone Manor, Bow, North Devon, was for thirty years well known as a consulting surgeon in London. He was born at Chulmleigh, in Devon, in 1838, where his father, Mr. J. C. Davy, had long practised. The son entered at Guy's

Hospital in 1858, and took the diploma of M.R.C.S. in 1860; afterwards he went to Edinburgh, where he graduated M.B. in 1862. After a winter in Paris he settled in London, became surgeon to the St. Marylebone General Dispensary, and assistant surgeon to the Westminster Hospital. He took the diploma of F.R.C.S.Eng. in 1868, and, without devoting himself specially to it, gave a great deal of attention to orthopaedics; that department of practice was then in a transition stage, subcutaneous tenotomy and excisions being the rule before antiseptic surgery, to which Davy never subscribed, became the practice. Davy learned of Sayre's method of treating spinal caries by the application of plaster jackets during suspension on a visit to New York, and was one of the surgeons who helped to popularize the method in this country. In 1878 he published in our columns a description of the method of compressing the common iliac artery by a rod introduced into the rectum. Two years later he published a volume of *Surgical Lectures*. He continued to reside and practise in London until about 1893, when he retired to North Devon, where he had always spent his holidays. He engaged in farming and in the management of the small estate he inherited from his father. Soon after settling in London he married the daughter of Mr. George Cutliffe of Witheridge, Devon, and is survived by two daughters. He had gradually become blind during the last years of his life.

Richard Davy had a genial personality, and possessed many friends among the profession in London. Surgeons who criticized his attitude towards antiseptics recognized his honesty of purpose, while students valued his careful clinical teaching, and respected his independence of view.

We regret to record the death, which took place on September 27th, at Trowbridge, of Dr. J. Tubb-Thomas, late medical officer of health for the County of Wiltshire. Dr. Tubb-Thomas, who was educated at Cork, Edinburgh, and Cambridge, graduated in 1886, and took the D.P.H. in 1896. After holding appointments at Lowestoft, and in Leicestershire and Rutland, he went to Wiltshire in 1899 as the first whole-time county medical officer. The war had greatly increased the strain of Dr. Tubb-Thomas's office, and after a period of impaired health he found it necessary in February of this year to resign his appointment; his services were retained, however, as consulting county medical officer of health. Dr. Tubb-Thomas was a Fellow of the Statistical Society, and past president of the West of England Branch of the Incorporated Society of Medical Officers of Health; he was a leading member of the Wilts Division of the British Medical Association. He was the author of *Preservatives in Foodstuffs*, *Shallow Wells and Town Water Supplies*, and numerous other works connected with public health. As Dr. C. E. S. Flemming said at a meeting of the Wilts Panel Committee: "By the death of Dr. Tubb-Thomas the medical men of the county have lost an old friend and valued adviser, who by his good nature, his hospitality, and his very human qualities had won in no ordinary way their affection and esteem." Dr. Tubb-Thomas is survived by a widow but no family.

We regret to announce the death of Dr. Charles Brooke Gratte, of Gold Tops, Newport, Monmouth. Dr. Gratte obtained the M.R.C.S. and L.R.C.P. diplomas in 1890; he was educated at Bristol, where he acted as assistant house-surgeon at the Royal Infirmary. After settling in practice in Newport, he became honorary physician to the Newport and Monmouth County Hospital; besides holding many other public appointments, he was lecturer to the Monmouth training centre for midwives. During the war he received a commission in the R.A.M.C. and served with conspicuous ability on the staff of the local military hospital. He was a member of the British Medical Association and had been a representative of the local Division on the Branch Council. Dr. Gratte enjoyed an extensive practice in the district, and his death, which took place suddenly from pneumonia at the age of 53, is keenly felt both by his patients and his colleagues.

Dr. John Kenrick Jones, of Llanrhaiadr, who died on September 30th, aged 61, received his medical education at the University of Glasgow, and took the Scottish triple qualification in 1886. He shortly afterwards settled in practice at Llanrhaiadr, where he became very popular. He had served as medical officer and public vaccinator of the Llanrhaiadr and Llansilin districts and of the Oswestry Union. In spite of the heavy calls upon his time he devoted much attention to public affairs, he was a J.P. for the county of Denbigh, had served for twenty years as chairman of the Llanrhaiadr school and had held the office of chairman of the Llansilin Education Committee and of the Llanrhaiadr Parish Council as well of the conjoint parish councils. He hardly ever took a holiday, and, though about twelve years ago he found himself suffering from Bright's disease, he kept at work until he had a seizure about twelve months ago. The funeral was attended by many friends.

Universities and Colleges.

UNIVERSITY OF EDINBURGH.

The following candidates have been approved at the examination indicated:

Third M.B., Ch.B. (*Materia Medica*).—Margaret S. R. Armstrong, Lilias F. E. Begg, J. Brown, Jane G. H. Burnet, C. G. Catto, G. G. Cochrane, T. J. Craig, E. J. Crawford, Jean Connochie, F. G. Creaser, A. H. Deighton, N. Fram, Flora M. Hogg, E. G. Hunter, Margaret W. Kemp, B. Leader, R. C. Little, J. R. Macleod, Susannah S. Murdoch, S. Petkoon, R. M. Saunders, H. Seal, C. Siung, A. T. Sloan, M. T. Smith, F. M. Stuart, M. Witkin.

UNIVERSITY OF GLASGOW.

The following degrees were conferred on October 11th:

M.B., Ch.B.—*A. P. Agnew, A. G. Aitken, Margaret Bennett, D. E. Brown, W. A. Galbraith, Dorothy J. L. Gallie, J. G. Gilmour, C. Glen, (Mrs.) Agnes S. Glover, C. N. Gordon, Mary B. Grant, Margaret Gray, H. W. Howieson, †T. T. Hutchison, D. Imrie, J. A. Jenkins, H. J. MacBride, A. M. M'Clure, W. R. M'Crae, A. B. Macdonald, E. P. Macfarlane, D. MacKenzie, Jean M'I. Mackintosh, Marie J. M'Naught, A. M'C. Macqueen, F. M'Vean, M. F. G. Main, A. Markson, Effie Niblock, J. Prentice, Mary Russell, †T. S. Sargent, Mary Shiskin, A. W. Smyllie, F. C. Speechly, D. Stewart, J. Stirling, Dorothy M. Summers, J. D. Whiteford.

The following candidates have been approved at the examinations indicated:

M.B., Ch.B. (M., Materia Medica and Therapeutics; P., Pathology).—J. B. Adams (P.), D. Baird (M.), A. L. Bernstein (M.), F. A. Brown (P.), J. E. Brown (P.), M. Brown (P.), R. O. Bruce (M.), J. A. Cameron (P.), J. Campbell (M.), H. Collingbourne (M.), A. MacD. Douglas (M., P.), A. Gardiner (M.), W. Geyer (M.), G. S. Gilchrist (M.), G. F. Graham (M., P.), R. A. Grant (P.), J. Hamilton (P.), W. Houston (M., P.), W. MacD. Johnston (M.), T. J. Jones (M., P.), D. A. Ker (P.), A. King (P.), F. J. Kitt (P.), T. Leckie (P.), J. E. S. Lee (M., P.), J. A. Lister (P.), A. Logan (P.), G. M'Alpine (P.), A. M. Maccallum (M.), H. M'Cluskey (M.), A. A. Macdonald (M.), C. F. H. M'Fadyen (M., P.), T. J. M'Kail (P.), K. W. MacKenzie (M.), M. M'Lean (M., P.), N. A. MacLean (M.), M. Macleod (M.), S. M'Mahon, (M., P.), R. C. Macmurray (M.), D. C. Marshall (M., P.), R. R. Morrison (P.), ‡I. Murray (P.), T. C. H. Neil (M.), T. Nicol (M., P.), T. C. Porter (P.), T. Prentice (M., P.), J. S. Ramage (M.), J. M'L. R. C. Ross (P.), J. Rowatt (P.), J. Russell (P.), W. Simpson (M., P.), A. Snaddon (P.), J. Sneddon (M., P.), A. B. Taylor (M.), E. J. T. Thompson (M., P.), A. Wilson (M.). Margaret Alexander (M.), Elizabeth B. T. Allison (P.), Margaret R. Balloch (P.), Mary E. Berry (P.), Mary A. M. Bonnyman (M.), Mary D. A. Boyd (P.), Jemima G. Brodie (M.), Isabella E. Campbell (M., P.), Margaret E. Campbell (P.), Margaret G. Carrick (P.), Evelyn L. Caskey (M., P.), Elizabeth S. Cook (M.), Katharine L. Couper (P.), Agnes C. J. Davidson, M.A. (M., P.), Martha D. Devon (M., P.), Alice M. S. Dewar (M.), Agnes F. Dickson (P.), Margaret A. Galbraith (M.), Marget L. Gilchrist (P.), Catherine M. Gray (M.), Irene Higgie (P.), Catherine Hill (P.), Helena J. S. Irving (M., P.), Elizabeth G. Jamieson (M.), Dora Karnovski (M.), Annie C. Kerr (P.), Elizabeth C. Kerr (P.), Janet S. Kerr (P.), Rhoda M. J. Lochhead (M.), Joan A. MacColl (P.), Eileen M. M. Macdonald (P.), Marion A. M'Kenzie (M.), Jean D. MacMurray (M., P.), Doris M. J. M'Nab (M.), Mary M'Naught (M.), Marion L. M'Quaker (M.), Agnes L. Mair (P.), Clara F. Marshall (M.), Elizabeth M. Nairn (M.), Sarah H. Nelson (M.), Annie B. Primrose (P.), Bessie S. Ross (M.), (Mrs.) Sarah Ross (M.), Katharine C. Shankland (M.), Bertha E. A. Sharpe (M.), Gladys A. G. Sharpe (M.), Effie S. Stephen (M.), Alison L. Taylor (M.), Marian Thom (P.), Janet A. O. Weir (M.), Evelyn A. Weyman (P.), Catherine B. Wilson (M., P.).

* With honours. † With commendation. ‡ Distinction in Pathology.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the meeting of the Faculty on October 4th Sir Donald MacAlister, K.C.B., was admitted as an honorary Fellow. The following Fellows were also admitted: J. M. Christie, C.B.E., A. M. Crawford, A. D. Gorman, A. B. Kelly, J. E. Paterson.

CONJOINT BOARD IN SCOTLAND.

The following candidates, having passed the First and Second Examinations, have been admitted Diplomates in Public Health:

Drs. L. H. Werden, J. Chalmers, R. T. Grant, J. Young, A. V. Dill, F. J. C. Johnstone, A. Wotherspoon, J. J. R. Binnie, A. K. Towers, D. Ferguson, F. J. Kirkness, Margaret McN. McGarrity, G. M. Elliott, G. C. McEwan, J. McIntyre, G. J. Linklater, Gladys A. A. Boyd, J. F. C. Haslam, G. Nicholson, W. S. Wallace, D. L. Baxter, Rosanna E. MacMillan, Elisabeth Harper, E. B. Munro, T. D. Inch, I. C. Mackenzie, A. P. G. Lorimer, F. G. Foster.

The Services.

PAY AND RETIRED PAY OF R.A.M.C. OFFICERS.

An Army Order (No. 437 of 1920) has just been issued amending the rates of pay and retired pay for officers of the A.M.S. and R.A.M.C.

With effect from April 1st, 1920, the following rates of pay will be substituted for those laid down in Table VI of the Pay Warrant of September 13th, 1919:

	£	s.	d.	
Major-General	4	15	0	per diem
Captain	1	7	0	,,
Captain (after six years' total service) ...	1	8	0	,,
Captain (after ten years' total service) ...	1	11	0	,,
Lieutenant	1	2	0	,,

The rates of pay admissible in the rank of Colonel, Lieutenant-Colonel, and Major will remain as laid down in Table VI.

It is further laid down that the "service element" for retired pay shall be at the rate of £15 for each completed year of service in the case of officers of the A.M.S. and R.A.M.C., instead of at the rate of £150 for the first fifteen years' service and £15 for each subsequent year, as laid down in paragraph 2 (a) of Table XVI attached to the Pay Warrant of September 13th, 1919. This amendment will have effect from the same date and under the same conditions as if it had been originally embodied in the table of the Warrant. The rate of "rank element" and the maximum rates of retired pay admissible for each rank will remain as laid down in that table.

The above amendments are contained in a Royal Warrant dated October 9th, 1920. On the Warrant are issued the following Army Council's Instructions:

Pay.—In the amended rates the increase of pay given in Army Order 324 of 1919 to a Captain after five years' total service disappears. An officer who has qualified prior to the date of this Warrant to the £1 7s. 6d. rate of pay may continue to draw that rate.

Retired Pay.—Steps will be taken to reassess retired pay already granted under Army Order 324 of 1919 in accordance with the terms of this Warrant. Individual applications will therefore be necessary, but in the event of considerable delay occurring before reassessment is made in any particular case, application should be addressed to the Secretary (F.3), War Office, S.W.1.

Medical News.

On St. Luke's Day, October 18th, at 3 p.m., the Lord Mayor of London will preside at a meeting at the Mansion House on behalf of the Great Northern Central Hospital.

Dr. Walter Rigby, on resigning the office of honorary surgeon to the Blackburn and East Lancashire Royal Infirmary to take up an appointment under the Ministry of Health, has been presented by the resident medical and nursing staffs with a fitted attaché case and a revolving bookcase.

The King has conferred the medal of the Order of the British Empire (Civil Division) upon Mr. E. B. Turner, F.R.C.S., and Dr. G. J. Lane, inspectors in the Metropolitan Special Constabulary, for service during the war "which has been distinguished by conspicuous courage or by exceptional zeal and devotion to duty."

The Westminster Hospital Old Students' dinner was held at the Imperial Restaurant on September 30th. Lord Glenconner, chairman of the hospital, presided, and 102 old students and guests were present—a record attendance during the last fifteen years. Lord Glenconner proposed the toast of "The hospital and medical school," to which the Dean of the Medical School, Dr. A. S. Woodwark, replied. Mr. A. H. Tubby, senior consulting surgeon of the hospital, proposed "The past and present students"; Mr. Arthur Evans and Mr. Brown responded. The toast of "The visitors" was proposed by Mr. Charles Ryall; Sir Malcolm Morris and Mr. S. Ingleby Oddie replied. The proceedings terminated with the toast of "The Chairman," submitted by Dr. de Havilland Hall, senior consulting physician of the hospital.

Four lectures on physic will be delivered by Sir Robert Armstrong-Jones, M.D., at Gresham College, Basinghall Street, E.C., on Monday, November 8th, Wednesday, November 10th, Thursday, November 11th, and Friday, November 12th, at 6 p.m. The subjects are: "The air we breathe," "The houses we live in," "The clothes we wear," "The food we eat." Admission is free.

The annual general meeting of the Society of Superintendents of Tuberculosis Institutions will be held at 122, Harley Street, W., on Monday, October 18th, at 4 p.m., when there will be discussions on (*a*) classification of cases of pulmonary tuberculosis; (*b*) sanatorium case records and charts; and (*c*) a scheme for sickness insurance for ex-patients.

The annual general meeting of the National Baby Week Council will be held at Armitage Hall, 224, Great Portland Street, W.1, on Tuesday, October 26th; the chair will be taken by Sybil, Viscountess Rhondda, at 3 p.m. An address will be given by Mr. H. O. Stutchbury, Assistant Secretary, Ministry of Health, on the Future of Infant Welfare Work. Sir James Cantlie and Dr. Elizabeth Sloan Chesser will take part in the discussion.

A series of six demonstrations of specimens in the museum will be given in the theatre of the Royal College of Surgeons, Lincoln's Inn Fields, by Professor Keith and Professor Shattock, an Fridays and Mondays, at 5 p.m., commencing on October 15th and terminating on November 1st. The demonstrations are open to advanced students and medical practitioners.

Lord Justice Atkin will deliver his Presidential address to the Medico-Legal Society on Tuesday, October 19th, at 8.30 p.m., at 11, Chandos Street, Cavendish Square, W.1. A discussion will follow, and Dr. Bernard Spilsbury will exhibit specimens.

The winter session of the North-East London Post-Graduate College will begin on Thursday, October 28th, at the Prince of Wales's General Hospital, N.15, without any formal opening address. In addition to clinics in the various departments of the hospital there will be a daily lecture-demonstration on groups of selected cases, clinical and laboratory methods, etc. It is intended to hold an intensive course in December, beginning on Monday, December 4th, at 10.30 a.m., particulars of which will be published later. The syllabus of the general course may be obtained on application to the Dean.

The next annual meeting of the American Dietetic Association will be held in New York from October 22nd–26th, 1920.

The late Mr. Sinclair White, C.B.E., formerly professor of surgery in the University of Sheffield and senior surgeon to the Sheffield Royal Infirmary, who died at Bournemouth on August 8th, has left estate of the value of £49,194 gross and £48,537 net. After personal bequests the ultimate residue, about £30,000, will go on the death of his wife to the Sheffield Royal Infirmary for a home of rest for the nurses of that institution.

The foundation stone of the British Hospital for Mothers and Babies, Woolwich (National Training School for District Midwives), will be laid by H.R.H. Princess Christian to-day (Saturday, October 16th) at 3 p.m. The institution was founded in 1905 to improve and lengthen the training of midwives, and it received from its inception the warm support and encouragement of the late Dr. Cullingworth and others. The work of the hospital has hitherto been carried out on a very small scale owing to lack of funds, and it is now refusing from twenty to thirty mothers every week.

The inaugural address before the Abernethian Society of St. Bartholomew's Hospital will be given on Thursday, October 28th, at 8.30 p.m., by Sir StClair Thomson, M.D., on "Recollections of Joseph Lister by one of his house-surgeons," illustrated by lantern slides.

The Post-Graduate College and past and present West London Hospital dinner will take place at the Café Royal, Regent Street, at 7.15 for 7.45 p.m., on Saturday, November 13th, with Mr. H. J. Banks Davis in the chair. Applications for tickets, price 15s., should be addressed to the Secretary, Post-Graduate College, West London Hospital, Hammersmith, W.6.

The annual dinner of the Society of Medical Officers of Health will be held at the Hotel Cecil on Friday, October 22nd, at 7.30 p.m. The new President, Lieut.-Colonel F. E. Fremantle, M.P., will take the chair. Tickets (15s. each) are obtainable from the Executive Secretary, 1, Upper Montague Street, Russell Square, W.C.1. The general meeting will be held on the same afternoon at 4.30 o'clock at the offices of the society, when the new President will be installed, and will give his address on "Parliament and public health." The annual meeting of the School Medical Service Group will be held at 1, Upper Montague Street at 11 a.m. on Saturday, October 23rd. New rules will be considered, and officers elected in accordance with the new constitution of the Society of Medical Officers of Health.

Chesterfield Lectures will be delivered on Thursdays at 6 p.m. at St. John's Hospital for Diseases of the Skin, 49, Leicester Square, W.C. These lectures are free to medical practitioners and to medical students who desire to attend regularly. After each lecture demonstrations will be given on special cases, followed by clinical instruction on patients presenting themselves in the out-patient department.

Two cases of typhus have recently occurred at Rotterdam, one in an emigrant at the emigrants' hotel of the Holland-America Line and the other in a dock labourer.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin:* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

"M.D." writes: Can any reader suggest treatment for staphylococcal infection of the anterior nares? Some patients have successive crops of small boils just inside the nostrils; they are very painful and do not respond to ordinary remedies.

"F. B. G." asks for suggestions for the internal treatment of a very obstinate case of oily seborrhoea capitis which has resisted all lotions, etc.

INCOME TAX.

"G. D. B." inquires as to his liability.

*** The allowances for children are £35 for one child and £27 for each other child fulfilling the conditions as to age or education. The wife allowance is merged in the personal allowance, which is £225 for a married and £135 for a single man. These allowances were provided by the Finance Act, 1920, which was passed after the form enclosed with our correspondent's letter was printed. His liability for the current financial year is as follows:

	£	s.	d.
Professional earnings	652	0	0
Deduct one-tenth (relief to earned incomes) ...	63	0	0
Assessable income	589	0	0
Allowances: Personal £225			
Children ... ... £63—288	0	0	
	281	0	0
Of this, £225 is chargeable at 3s. ... ... = 33	15	0	
£56 is chargeable at 6s. ... ... = 16	16	0	
	50	11	0
Deduct life assurance allowance, £53 at 3s. ... =	7	19	0
Net tax payable, including that deducted from loan interest	42	12	0

"BACHELOR" sends some queries the purport of which will be sufficiently clear from the statements below.

*** (1) The assessment for 1920-21 on the practice profits must be made on the average of three years, provided that the practice was in fact maintained in existence during "Bachelor's" absence on military service.

(2) He can deduct one-half of the value at which the house is assessed to income tax, usually approximately the same as the rateable value for poor rate purposes; he cannot therefore deduct a proportion of the economic rent until he has to pay income tax under Schedule A on that basis.

(3) The cost of internal redecoration, exclusive of any improvements, is admissible for tax purposes in so far as it was incurred on those portions of the premises put to professional use, and his liability for 1920-21 apparently works out as follows:

	£	s.	d.
Earned income £373; less one-tenth (=£37) ...	336	0	0
Untaxed interest	17	10	0
	353	10	0
Allowance	135	0	0
Chargeable at 3s.	218	10	0

This leaves due, of the £225 which should be taxed at 3s., a balance of £6 10s., and the assessment under Schedule A on his residence should to that extent be charged at 3s., and as regards the balance at 6s. There remains only the question as to the allowance for the interest paid to the bank. We suggest that the most convenient course will be to leave that matter until the end of March, 1921, and then to obtain from the bank a formal certificate as to the precise amount of interest paid for the financial year; the certificate should then be sent to the local inspector of taxes with a request that the appropriate allowance should be made from the July, 1921, instalment of the tax under Schedule A or Schedule D, or both.

REISSUE OF UNIFORM CLOTHING TO WORKMEN.

"ACUS."—The practice of passing on from male employees to their successors uniform suits of clothing is very undesirable; especially is this the case as regards trousers or breeches. There ought to be no difficulty in arranging that these clothes should remain the property of the workman. It is certainly not sufficient to hang them up in a chamber exposed to the fumes of sulphur. If they are disinfected they should be subjected to steam under pressure.

CLIMATE IN RHEUMATOID ARTHRITIS.

DR. LEIGH CANNEY (London) writes in reply to "Rheumaticus" (September 25th, 1920): Cases which have been treated by vaccines and spas at home repeatedly are found to do well by treatment in warm dry climates, especially Egypt. Arrest of activity of the process is generally notable towards the end of three months, and a second or even third winter is desirable. Medical guidance is essential to success. There is no climate in this hemisphere possessing the essential qualities of great dryness and warmth, as good as that of Egypt, and especially Upper Egypt. A full account of this climate and its effect on disease will be found in Hobhouse's *Health Abroad* (Smith, Elder, and Co.).

LETTERS, NOTES, ETC.

LONDON HOSPITAL CATGUT.

MR. E. W. MORRIS, C.B.E., House Governor of the London Hospital, asks us to mention the new venture of the London Hospital in making surgical catgut and selling it to other hospitals and to surgeons. "Owing to the war," he says, "there has been much difficulty in obtaining trustworthy catgut; we therefore have fitted up plant, which is open to inspection at all times, for the preparation of surgical catgut from the raw intestine to the finished article. One merit we claim for it is that sterilization takes place when the sheep's intestine is in the flat and before it is spun into threads, and therefore we eliminate the danger of bacteria being enclosed in the centre of the thread, secure from the action of antiseptics, and only to be freed when the catgut is absorbed. As it is as easy to make for twenty hospitals as for our own, we have plant sufficient to make much more than our own requirements, and to sell to those who desire a trustworthy catgut. Any profits accruing go, of course, to the general funds of the hospital. Messrs. Allen and Hanburys have consented to be our distributing agents."

MOTORISTS AND OVERHANGING HEDGES.

THE Automobile Association and Motor Union has issued an appeal to surveyors throughout the country on the question of the danger caused by overgrown hedges, bushes, etc., at cross roads, sharp bends, and bad corners. Under the Highway Act surveyors have considerable powers enabling them to deal with this subject, but it is suggested that local landowners, as well as railway companies and other big property owners, can render great assistance in this matter. A necessary improvement can often be carried out with little or no expense to the owners of the property, and may possibly be the means of averting fatal accidents.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 41, 44, 45, 46, and 47 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 42, 43, and 44.

THE following appointments of certifying factory surgeons are vacant: Inverary (Argyll), Ivybridge (Devon), Newtownbutler (Fermanagh), Stockport (Chester), Usk (Monmouth).

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	7	6
Each additional line...	0	1	3
Whole single column	6	0	0
Whole page	16	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.